used, the duration of therapy and probably the age, the susceptibility and the pre-existing personality of the patient.

5. Rauwolfia preparations should probably be given with great caution to patients with a previous history of mental depression, especially if they are in the fifth decade of life or more.

6. These agents should be used at the lowest effective dosage for the reduction of blood pressure. If reserpine is used, the dosage should be under 0.75 mg. a day.

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RÉSUMÉ

Les auteurs ont été à même de suivre une série de 296 hypertendus dont 195 recevaient une préparation quelconque de Rauwolfia. Alors qu'aucun des 101 ne recevant pas de Rauwolfia n'accusa de trouble mental, 30 de ceux qui en reçurent montrèrent un état dépressif. Ces symptômes se manifestèrent dans une moyenne d'environ 4 mois après le début du traitement. Les doses étaient supérieures à celles communément employées. Dix de ces malades durent être admis à l'hôpital pour y subir des traitements psychiatriques. La plupart s'améliorèrent, plusieurs même guérirent complètement à la simple diminution de la dose ou à la suppression de la Rauwolfia; cependant, un cas se montra rebelle à deux séries d'électrochocs. La thérapie fut reprise avec rechute dans certains cas et bonne tolérance dans d'autres. Il semblerait que l'âge des malades ainsi que les traits de leur personnalité soient des facteurs d'aussi grande importance dans le développement de ces troubles que les doses de médicament employées. M.R.D.

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PSYCHOSIS AND ENHANCED ANXIETY PRODUCED BY RESERPINE AND CHLORPROMAZINE*

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WE FIRST REFERRED to the production of psychosis by reserpine and chlorpromazine in our preliminary report on the use of reserpine† in psychiatric patients.[8] Freis,[3] Doyle[2] and other authors[4, 5, 12] had previously mentioned mainly depressive reactions and an occasional anxiety reaction, as occurring in patients treated, on a long-term basis, with reserpine for essential hypertension. Recently, other authors[1, 6, 11] have reported psychotic depressions occurring during treatment for essential hypertension with reserpine. These latter authors have emphasized these reactions, whereas earlier authors, with the exception of Freis, had not done so. We believe our work to be the first dealing specifically with psychiatric patients, and offering an explanation of the mechanisms involved in these reactions. To our knowledge, it is also the first to implicate chlorpromazine as well as reserpine.

In a study of the physiological and psychological effects of reserpine on affect, 55 carefully selected psychiatric patients were intensively studied over a one-year period (July 1954 to July 1955). The research design was novel.[8, 9] The data and conclusions of this study have been reported in detail elsewhere.[8-10] Concomitantly chlorpromazine was used in 35 cases on a non-research basis, i.e. when indicated as an ordinary drug. Sixteen out of the above-mentioned groups are the subject of this paper, because they were characterized by the same general reaction types and by common psychodynamic elements. The present paper consists of a detailed report of these cases, a discussion of the factors involved, and a statement of how we believe this phenomenon is produced.

Dose: The average dose of reserpine in the 55 cases was 7 mg. daily orally or intramuscularly. The average duration of treatment was 26 days. For chlorpromazine the dose was 50-100 mg. three or four times a day orally or intramuscularly. Duration of treatment varied greatly in the 35 cases.

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†Supplied as Serpasil through the courtesy of Dr. C. W. Murphy, Medical Director, Ciba Company, Ltd.

Intensive knowledge of the psychodynamics and interpersonal relations has enabled us to formulate opinions as to the psychological as well as the physiological factors involved in the psychic reactions.

PRODUCTION OF PSYCHOSIS OR OF FURTHER PSYCHOTIC DISINTEGRATION WITH RESERPINE. (B.P., P., R. = blood pressure, pulse and respiration.)

1. (Case 11). G.A., a 25-year-old man. Before receiving reserpine, he showed perplexity, indecision, ambivalence and ambitendency. He could not make up his mind as to the proper course, was somewhat sad and unhappy, and had a bland expression. He was anxious, but masked all the above with a great need to move around, be tremendously active, and unrestrained in his motor activity, such as drinking, going out, cashing bad cheques or running up debts. His symptoms developed when he was removed from his paratrooper's job, involving frequent jumping, to one requiring very little actual duty or activity in a newly forming regiment. When frustrated in his outgoingness by being confined to the ward, he became increasingly tense and showed an inappropriate euphoria. He was given 2.5 mg. reserpine intramuscularly four times a day for two days, and 3 mg. orally four times a day for 11 days. Weight went from 210 to 218 lb. in seven days, stabilizing at 218 lb. There was no œdema. His appetite had been good, but the patient complained that he lost his "zest in eating" while on the drug. Blood pressure fell from 125/70 to 125/70-90/40, depending on the dose, stabilizing around 100/60 mm. Hg. Pulse rate fell from 80 to 60 (variation 80-56); respiration rate remained at 20. The patient felt that he was "worse". The results in respect of affect were considered poor. The patient was slowed down; his motor activity was markedly cut; he was tired, drowsy and irritable, and felt "held down". He could move his body, but tended to move it in one block, although he was able to do otherwise. He was unhappy, jittery and extremely anxious. He felt cut off from life, "unable to sleep, unable to stay awake". He felt he was "going queer", felt cut off "from outside things", and felt that his body was changing. Main observable changes were slowing down, inappropriate euphoria, panic at being chemically held, and a feeling of change and dissociation and of changes in body image and in his motor control. The natural course of the disease was changed for the worse; from an acting out person who mastered his anxiety through activity, he became an inhibited, unhappy frustrated man whose mental content became psychotic. The side-effect was nasal stuffiness. The patient was taken off the drug, and returned to his pre-drug state within a week. He was a very happy and relieved man at this, and remained with his acting out behaviour for the remaining month in hospital.

Comment: The drug removed his ability for vigorous motor activity at all levels. This rendered him more passive and he felt this as a lessening of his masculine prowess. He became paranoid.

2. (Case 16). S.O., aged 33, before receiving reserpine showed the beginnings of motor overactivity, flight of ideas, a tendency to dissociated thinking and a mild euphoria. He was aware that this was an abnormal state. On admission he was dependent, clinging, shaking hands, and speaking pleasantly to everyone. He was inclined to be passive in his interpersonal relations, and was open to verbal reassurance with good temporary effect. He had religious delusions and illusions, and grandiose ideas, and showed perplexity at his state, ambivalence, and ambitendency. His normal premorbid personality was marked by considerable drive in all activities and by social outgoingness. Physical findings were normal. Dosage: he received 5 mg. i.m. b.i.d. stat, then 5 mg. i.m. t.i.d. for three days, then q.i.d. for two days. He received one extra 5 mg. i.m. dose on the last day. Weight went from 124 to 129 lb. in six days. No œdema. His appetite changed from poor to good. His B.P., pulse and respiration were 130/90, 112, 20 before receiving the drug and 130/90-90/60, 88-72 and 20 while on the drug. B.P. fluctuated with dose and averaged 100/70. Patient felt he was "not helped". The result on affect was considered poor. Patient became calm and drowsy and felt held down. He was able to battle with his delusions, grandiosity and disorientation. His flight of ideas stopped. His irritability and impulsivity remained. Thus, the initial effect was excellent, but only enough drug to calm him had been given, the aim being to permit him to be up and around. When an extra dose which cut his activity to a level that immobilized him was given, he became paranoic, fearful, agitated and suicidal. He feared a plot against him, he felt that things had changed. He couldn't move, he felt we were changing him, and he became afraid that he would have to kill himself. The natural course of the disease was unchanged. The patient moved head, trunk and upper limbs in one block when under the influence of the last dose. Because of his condition he was transferred to a closed hospital. Final diagnosis: schizophrenia, schizo-affective type.

Comment: This man had an early psychotic process which he was able to cope with as long as he had motor activity as a defence. His defensive mobility was chemically removed, and greater psychotic deterioration resulted.

3. (Case 45). J.R., aged 34, before reserpine treatment had marked anxiety. He was trembling, sweating, scratching, moderately sad and markedly irritable. There was dermatitis eczematoides, interdigital dermatitis, and low back pain without physical signs. Dose: 7 mg. daily p.o. for 21 days. He gained 5 lb. in 21 days. No œdema. Appetite remained fair. B.P., P. and R. before reserpine treatment 130/80, 90, 20; on drug, B.P. fell to 100/70 in a day, then fluctuated between 140/90 and 90/50, P. 90 to 68, R. 20. Patient felt he was "not helped". Results on affect were considered poor; the patient was slowed, lost his tremor, sweating, irritability and sleeplessness. He appeared less sad. The low back pain was unchanged, but he developed bowel symptoms which persisted, and marked projective thinking. Major observed changes were that he appeared slowed, tired, sleepy and drowsy. His ability to relate in the interpersonal field was reduced. The natural course of disease was changed for the worse; from obsessive compulsive state, with signs of anxiety and with somatization, to loss of anxiety but also loss of ability to function positively. He felt passive and frightened. He developed more somatic symptoms, and paranoid (projective) thinking. Side-effects were stuffiness in nose, nausea, and on one occasion hiccups. The patient was taken off the drug and given sub-coma insulin and supportive psychotherapy; he showed a little symptomatic improvement in 1½ months.

Comment: Here again the physiological effects of chemically "holding him down" were intensely threatening, and resulted in psychosis.

4. (Case 48). A.A., aged 38, complained of sleeplessness, headache, bowel complaints, and itching around the anus and genitals. Few overt signs of anxiety. He was thin, with dermatitis around anus, genitals and knees. Dose: 2 mg. daily for 15 days. He gained 3 lb. in 15 days. No œdema. Appetite changed from poor to fair. B.P. 140/80 before drug; on drug fluctuated from 140/80 to 100/50. P. fell from 90 to 60, R. remained at 16. Patient felt he was "helped". For one week patient slept better and was uncomplaining. He was quiet, was slowed, felt tired, and was socially more co-operative and outgoing. His activity was markedly cut down. His passivity during this week was accepted by his physician, and the patient felt better because of his acceptance by a strong masculine figure. After the week, the patient became

afraid of his passive role in reference to the physician, and complained that he was being "held down" and didn't know why. In the space of two days he became suspicious of his physician, with marked paranoid distortions of all that happened in his environment. The natural course of the disease was changed for the worse in that, from the initial symptomatic improvement, the patient felt threatened by his chemically induced passivity and became overtly paranoid. The drug was stopped, his physician happened to go on vacation, and within two weeks the patient had returned to his pre-psychotic state. Psychotherapy continued, and the patient was discharged as improved after three months.

Comment: As the transference developed, he feared the passivity imposed on him by the drug since he distorted the physician's motives. He became psychotic.

5. (Case 50). M.J., aged 39, before reserpine was slow in his physical movements, gloomy, covertly hostile, sleepless, paced the floor, and showed considerable despondency. Neck movement was limited because of previous discectomy. Dose: 1 mg. p.o. for 10 days. He gained 2 lb. in 10 days. No œdema. Appetite remained fair. B.P. 130/90 went to 120/70, P. went from 100 to 70, R. remained at 16. Patient felt he was "made worse". Results on affect were considered poor. The patient became slowed, showed more psychomotor retardation and more despondency, and was gloomier. He had less ability for social contacts, and lost all ability for even subtle expression of overt hostility. He developed self-destructive nightmares, and became overtly suicidal. The major observable changes were that all symptoms of depression were increased except his pacing. The patient lay on his bed and appeared dejected. The natural course of disease was unchanged, in that a depressive reaction became sufficiently severe to be considered a psychotic depression. The patient lost his small ability for outward expression, and his long-standing somatization through headache, stiff neck, and arm pain increased. There were no side-effects. Patient returned to his pre-drug state within one week of discontinuation. He improved with about 1½ months of further psychotherapy.

Comment: In this depressed patient, the drug removed the limited ability for psychomotor activity, and the patient felt even more helpless and inadequate. A deepening of the depression to psychotic levels followed.

6. (Case 51). M.A., aged 31, before reserpine showed anxiety, restlessness, fear, inappropriate affect, bodily delusions and auditory hallucinations. Physical findings were normal. Dose was 15 mg. i.m. daily for 8 days. Patient gained 9 lb. in 8 days. No œdema. Appetite changed from poor to good. B.P. went from 170/80 to 120/70 while on drug, P. from 100 to 72, R. remained at 16. Patient felt he was "helped". The results as to affect were considered poor. The signs of anxiety, agitation and disorganized behaviour disappeared, and the patient became a quiet and resigned psychotic instead of one full of fight and turmoil and still battling with his illness. The major observable changes were that he became drowsy, lethargic, slowed down, and apparently resigned to his hallucinatory experiences. He was unable to use his previous psychotic mechanism of going through a ritual of active symbolic bodily movements to make his somatic delusions disappear. The natural course of the disease was unchanged, but an active, turbulent psychosis was changed into a quiet one. There were no side-effects. The patient was sent to another hospital where he received electroshock and insulin, but still had residual schizophrenic symptoms.

Comment: This psychotic patient was anxious and struggling with his illness. The drug removed the ability to mobilize energy into physical activity, and he became a quiet, resigned psychotic.

PRODUCTION OF PSYCHOSIS OR FURTHER PSYCHOTIC DISINTEGRATION WITH CHLORPROMAZINE

7. T.J., aged 33, before chlorpromazine showed signs of increased motor activity and speech, euphoria, flight of ideas, and a feeling that he alone was doing his job as it should be done. He had shown increasing evidence of the above for approximately one week, and had been sleepless, anxious and somewhat irritable for two or three weeks before that. He was given chlorpromazine 50 mg. i.m. q.i.d. for approximately 30 days. At the end of the second day, he was quiet, calm, and no longer overactive. He sat quietly by his bed, smiled at everyone who approached him, and when he felt "like doing something to keep busy" asked permission to wash the windows. In psychotherapeutic interviews, however, or if asked how he felt or what he thought, he stated that he could "see angels sitting in the tree tops outside the windows" and they were talking to him. He added that there was no longer a need for him to fight because all was now settled. He was waiting orders from God to join the Heavenly Father or to remain on earth awhile. He presented autistic thinking, delusions of grandeur and persecution, and ideas of reference. Thus, from an overactive person with hypomanic symptoms but no known hallucinations he was turned into a quietly hallucinated person with typical schizophrenic symptoms. He was treated over a four-month period with reality-testing psychotherapy, occupational therapy, and a therapeutic work programme. After three months he was free of delusions, hallucinations and ideas of reference. There was some residual autistic thinking.

Comment: In terms of time this was the first case in our hands to show an increased psychotic deterioration when activity, used as a major defence, was chemically removed (Sept. '54). A manic symptomatology covering a homosexual panic was changed to a quiet, but typical paranoid schizophrenia.

8. K.J.G., aged 22, before reserpine showed acting out and characterological defences (character neurosis) such as a surface affability, cheerfulness, and an apparent ease in his interpersonal relations. This latter was characterized by drive, energetic actions and much motility. Thus, he would drink beer "with the boys", boast, act "like a big shot", and spend a great deal of money to "prove" that he was a "big shot". On admission, he showed all of the above characteristics, plus marked anxiety, fear that he was going insane, loss of appetite, pain in the right genito-femoral region, and, beneath his motor activity, a feeling of sadness and despondency. Because of his marked anxiety, he was given chlorpromazine 50 mg. i.m. t.i.d. for one day, then 50 mg. p.o. t.i.d. This resulted in a marked diminution of the patient's motor activity. He felt tired and weak, and complained of having "a dry mouth" and of being dizzy. He was unable to engage in his usual motor activities such as sports, and spent much time lying in bed. With this physical inactivity, he became more overtly sad, despondent, and irritable; at night time, he began to hear voices, which frightened him, although in the morning he was uncertain as to their reality. The drug was discontinued when the above phenomenon developed after six days. He became more active one day after the drug was discontinued, and within the next three days, with return of his motor outlet, much of the depressive element lessened, although he remained markedly anxious. He was transferred to another hospital because of ineligibility for treatment under D.V.A.

Comment: Here again removal of activity, which was a major defence and "demonstration of his masculinity", resulted in further psychic deterioration in a patient with a borderline state.

9. (Courtesy of Dr. C. Conway Smith—Montreal.) This 74-year-old man had had a previous manic episode 15 years ago, which had been treated by E.C.T. This

latter had not interfered with his usual outgoingness, at the time.

In September 1955, he consulted a physician because of increased irritability, impulsiveness, and the beginnings of increased motor activity. Normally this patient was an extremely active, exacting, and aggressive business man whose sensorium and intellectual capacities were unimpaired, and who was considered to have an obsessive-compulsive personality with a tendency to marked mood swings. Because of increased symptoms his physician put him on an unknown dose of chlorpromazine. This dose was sufficient to markedly cut down his activity, and with the removal of this outlet the patient became increasingly disturbed. His irritability increased and the patient felt inwardly more excited, even though he was unable to express this at a motor level. The patient developed jaundice at this point, and an exploratory laparotomy was performed. Being thus further immobilized, he became even more excited and difficult to manage. A psychiatrist (Dr. C. C. Smith) was consulted at this point, and hospitalized the patient in a closed setting. Reserpine 1 mg. b.i.d. was substituted for the chlorpromazine. The patient became more mobile and physically active, since the dose of reserpine was insufficient to have the same chemically holding effect that the dose of chlorpromazine had had. As the patient became more physically active, his agitation and excitement diminished. He was given ground privileges shortly after his arrival at the closed hospital, and improved markedly over a period of one to two months. Towards the end of his hospital stay, some peripheral œdema was noted and reserpine was discontinued. Dr. Smith felt that the use of reserpine in sufficiently low dosage to permit the patient recourse to activity as a defence helped him cope with his fear of being made helpless, and thereby less manly.

Comment: Here again, removal of the patient's long-established mode of reassuring himself as to his adequacy and manhood through activity produced further psychotic deterioration. Restoration of activity helped his recovery by offering an old and well-established pattern of expression.

Enhanced Anxiety Produced by Reserpine

10. (Case 9). S.J., aged 25, before reserpine showed marked anxiety, poor control over aggression, weakness in the knees and tremor of the hands and legs when angry. He often became panicky, and had a slow slurred speech. He had from his early childhood been awkward, and showed a marked inability to master muscular co-ordination. He had spontaneous hypoglycæmia with fugues. He hyperventilated when he was panicky, and at times had hypnagogic hallucinations. He was an asthenic, thin man, with a marked awkwardness which seemed to express his inability to master himself. Dose: 4 mg. orally daily for 8 days. The patient gained 5 lb. in 7 days. There was no œdema. His appetite remained good. His B.P., P. and R. went from 120/76, 72, and 20 before the drug to 120/70-90/68, 68 and 22 while on the drug. The patient felt he was "made worse". The results on affect were considered poor. The patient was made weak and dizzy, and his already intolerable awkwardness increased. He felt more helpless and passive, looked worse and felt worse. The major observable changes were weakness, tiredness, dizziness, increased awkwardness, and enforced passivity. The result on the natural course of the disease was unchanged, but the patient felt infinitely more anxious and less the master of himself. Side-effects were headache and nasal stuffiness. Investigation showed involvement of total body and psyche in the illness (i.e. autonomic nervous system, endocrine, psychic, muscular and E.E.G. findings). Reserpine was stopped and mild phenobarbital sedation substituted. Psychotherapy continued, and the patient felt considerable relief within three days (as the drug wore off). He improved under psychotherapy and was discharged 10 weeks later.

Comment: The drug increased his already intolerable awkwardness by removing his capacity for voluntary energetic movement. This made him feel less adequate, i.e., less manly, and increased his anxiety.

11. (Case 17). J.C.A., aged 39, before reserpine had somatic pains (low back pain, pain in right shoulder blade and right knee). He was unhappy and moderately despondent. He was irritable, hostile, and aggressive and insisted that the pain was organic in origin. Chronic prostatitis, an enlarged prostate and moderate essential hypertension (150/100 mm. Hg) were found on physical examination. Dose: 2 mg. orally for 5 days. His weight did not change and his appetite remained good. His B.P., P. and R. went from 150/100, 80, 20 to 100/70, 72, 20. The patient felt he was "made worse". The results as to affect were considered poor. The patient was made weak, dizzy and more passive. He reacted to this by increased anxiety and agitation. He felt useless, frightened, and weak, and his pains increased. The major observable changes were weakness, dizziness, agitation, and more passivity. The result on the natural course of the illness was unchanged. The patient remained an obsessive-compulsive with somatic symptoms and a marked dependency as manifested in his desire for a pension. Side-effects were diarrhœa for 24 hours and a stuffy nose. The drug was stopped, and he lost his fear of the effects of the drug in two to three days, and along with this the feelings of indecisiveness and frustration. He continued on psychotherapy. His depression was significantly improved through working with his hostility. In the next two months his somatic complaints and his demands for pension persisted.

Comment: The physiological effects of the drug threatened this passive-dependent man by reducing his capacity to control his own body. He interpreted this as a "demasculinization" of himself and became markedly anxious, with increased somatic complaints.

12. (Case 28). C.J., aged 29, was weepy, unhappy, covertly hostile and manipulating in his interpersonal relations. He was effeminate in gesture and speech. He had headache and nausea, and seemed to be a very passive and dependent person. Physical findings were normal. Dose: He received 2.5 mg. i.m. the first day and responded with marked anxiety and more weeping, all directed at the nursing staff in an attempt to manipulate them into stopping the injections. On the second day he received 5 mg. i.m. and felt so terrible, with such marked panic at night, that the medication was cancelled. He stated that he could not stand the weak, helpless feeling the drug gave him, and that the thought of it made him sweat and shiver. The patient felt he was "made worse". The results as to affect were poor. His headache, sadness and anxiety were worse, and on the second evening he had a mild attack of panic. The major observable change was a marked increase in his anxiety to the level of panic. Nausea was the only side-effect, after withdrawal of reserpine. Psychotherapy plus the hospital milieu helped the patient. He left, improved, approximately one month later.

Comment: Here a passive dependent, somewhat effeminate man with considerable anxiety and a mild depressive reaction, panicked at the chemical effects of being made weaker and less active by the injections. He resorted to his characterological defence of manipulating the environment away from a "dangerous" situation.

13. (Case 37). Miss W.P., aged 21, before reserpine was intensely anxious, fearful, unhappy and impulsive. She was physically very active, and blinked her eyes continually. She had suicidal thoughts, and was very disturbed by her conscious awareness of being attracted to other women. Physical findings were normal. She received 5 mg. orally daily for 15 days. She gained 10 lb. in 15 days. There was no œdema and her appetite remained good. Her B.P., P. and R. went from 120/70,

68, 16 to 95/50, 72, 16 in 48 hours. B.P. stabilized at 110/60. She felt she was "made worse". The results as to affect were considered poor. The patient became "groggy", weak, dizzy and felt chemically held down. She was very frightened by this. She lay on the bed, slept continually except at meal time, and was very irritable and hostile. She began refusing the drug. The natural course of the illness was unchanged. There were no side-effects. The drug was discontinued, and she reverted to her pre-drug state with much relief. Psychotherapy continued, and she improved to a limited degree in the next three months.

Comment: This girl had a marked attachment to the treating physician, and interpreted the drug as a seduction or assault by him. The physiological effects in making her weak, tired and relatively helpless were doubly threatening because they removed her ability for aggressive independent action as well.

14. (Case 53). C.M., aged 37, before reserpine was sleepless and moderately anxious, with an obsessive-compulsive personality, and a right-sided spasmodic torticollis of 18 months' duration. He received 5 mg. i.m. daily for 10 days, then 3 mg. orally for 10 days. He gained 3 lb. in 20 days, his appetite went from fair to good and there was no œdema. B.P., P. and R. went from 124/84, 80 and 20 to 110/70, 72 and 20. The patient felt he was "not helped". The results on affect were considered poor. He was slowed, felt "lifeless, doped", "useless", had a sad facies, and looked dull and inert. He showed a marked diminution in his social activities. The natural course of the disease was unchanged. He became more depressed and anxious and discharged himself from hospital.

Comment: The patient became more depressed and anxious, feeling threatened at being chemically held down. He considered this as an assault and a seduction, and ran away from it by discharging himself from the hospital.

Two other cases with reserpine will now be presented with the same psychodynamic and physiological constellations. Here however, in contradistinction to the other cases, circumstances were such that they were benefited by the drug.

15. (Case 26). C.J., aged 29, had been hospitalized for several months with some benefit. He went on a week-end pass and spent much of his time drinking beer with male friends. He panicked afterwards, and made a suicidal gesture by swallowing some barbiturates. He returned to the ward despondent, very anxious and almost in panic. He was jittery, perspiring, trembling, crying. He was given 2 mg. i.m. as night-time sedation, and he received the same dose nightly for seven days. The patient felt that he was "helped". Results as to affect were considered good. The patient was initially anxious and afraid of going to sleep. He remained awake most of the first two nights. When he was told that he was in a hospital, that his fear of what could happen to him was understood, but that nothing was going to happen to him here, he relaxed and calmed down, and at the end of the seventh day asked for further injections.

Comment: This patient had been in homosexual panic, i.e. he feared that an unconscious uncontrollable urge for some sort of homosexual contact would become conscious. He thus feared a drug that would render him more helpless. But in the "safe" reassuring atmosphere of the hospital, he relaxed and obtained unconscious but safe gratification of his need to be assaulted (i.e. injections) and felt better as a result. The safe hospital milieu and understanding physician made the difference between a good and bad therapeutic result in this case.

16. (Case 47). W.Y., aged 38, before reserpine was so angry at being jilted by a girl that he had been on a five-day binge and was shaking, sweating, pacing the floor, crying and expressing great fear of suicide or homicide. He was known to have a violent temper that was difficult to provoke, but once provoked he had in the past been known to give way to great physical violence. Physical findings included slight jaundice, a large tender liver and early bronchopneumonia. The diagnosis was acute depression with alcoholism, infectious hepatitis and bronchopneumonia. The patient received 40 mg. reserpine daily orally and i.m. for 20 days, and felt that he was "helped". The results on affect were good. Anxiety and tremor were dispelled; the patient was inert and listless in bed and was therefore passive, and reassurable as to violence. On psychotherapy and medical treatment he moved towards aggression related to reality. He was slowed to the level of complete bed rest for one week, after which he was able to move, but moved like an automaton. The natural course of the disease was changed. The drug interrupted an acute psychotic episode by rendering impossible the threatened eruption of aggressive feelings and drives. Nasal stuffiness was the only side-effect. He returned to army duty mildly euphoric after reserpine was stopped.

Comment: Here the very passivity and helplessness, which in other circumstances this man would have probably feared as a feminizing thing, were welcomed and sought as protection against his aggressive impulses—with good therapeutic result.

DISCUSSION

A series of patients have been presented in whom two drugs, quite useful in psychiatry and enjoying a current vogue, caused a psychotic process, further deterioration of a psychotic process, or enhanced anxiety. Both these agents have fairly standard physiological effects for a given dose. In psychiatry, these physiological effects are useful to relieve selected are symptoms. The drugs are therefore not psychiatric "specific agents" but *symptomatic* drugs.

A standard physiological effect of both drugs is to chemically "hold down" the patient. It makes him feel tired, weak, and, in adequate dosage, incapable of mobilizing much energy into physical activity. There are other effects which are predominantly *psychological* and are the result of the way in which the physiological effects fit into the patient's way of handling and expressing his conflicts (i.e. defences). When a patient does badly, it is due to the way in which the physiological effect *psychologically* threatens him.[10]

This report does not mean to imply that reserpine and chlorpromazine have no place in psychiatry. Rather, the good or bad effect depends on the last-mentioned consideration. In all the cases reported here, the desired physiological effect for which the drug had been given was reached. That is to say, the patient had been slowed, felt tired, was calmed, and had his

activity cut, and it was precisely this physiological effect that was *psychologically* threatening to the patient.

The following common psychodynamic elements were found:

1. *Fear of increased passivity.*—The chemical "holding down" action of these drugs removed activity as an outlet. A large group of patients with marked doubts about their masculinity, and with marked feminine identifications, express these in conflicts over their sexual, social, and intellectual potency. Many of these patients use activity in one or all of the above spheres as a means of reassuring themselves that they are adequate males. When this activity is used as a *major* defence, removing it chemically, by rendering them incapable of energetic action, is very threatening. These patients consider activity to mean masculinity and passivity to mean femininity (Cases 1, 2, 3, 6 and 7 show this feature).

Thus for the same intrapsychic conflict, a better integrated defence, i.e. one allowing better contact with reality (activity), was chemically removed. Under the threat of increased relative passivity (femininity) these patients reacted with more poorly integrated defences, because of the intolerable anxiety produced (see Dr. D. G. Wright's theory of schizophrenia[13]). This results in either enhanced anxiety or further breaks with reality (i.e. psychosis).

2. *Fear of impaired body function or of body image changes.*—Another group showed essentially the same psychodynamic conflicts over psycho-sexual identifications as group 1 but expressed it clinically as fear of impaired body functioning or of body-image changes. This group interpreted the physiological effects of these drugs, and/or the multiple side-effects, as a lessening or impairment of body function. Again, as in group 1, and for the same psychological reasons, changes meant increased passivity (i.e. femininity). This lessened control over themselves caused increased anxiety, and if the latter proved intolerable, a "downward" rearrangement of the defences into psychosis. Patients with obsessive ruminations over bodily health often show increased anxiety when the multiple physiological effects and side-effects of these drugs increase somatic dysfunctioning.

3. *Increase in depression.*—The depressed patients became more depressed. The action of these drugs in further limiting the expression of hostility through psychomotor activity, or limiting ability for some interpersonal relations, increased the feeling of personal helplessness and unworthiness, and therefore unconscious aggression as well.

4. *Interpretation as assault or seduction.*—Several patients, including the only woman in this report, interpreted the physiological effects, in rendering them less active, weak, passive and less the master over themselves (i.e. more in the doctor's power), as an actual or threatened assault or seduction. This they interpreted as either homosexual or heterosexual. When this was too threatening, and therefore unwelcome, the psychiatric disability increased. It should be pointed out that safe unconscious gratification in the protective hospital milieu, of the same need to be seduced or assaulted can prove beneficial (cf. Case 15).

From the above, it becomes clear that the clinical nosological entity produced—e.g. paranoid reaction, enhanced anxiety, depression, or agitation—is not dependent on a specific action of the drug concerned, but is rather a result of the way in which the patient responds, with all his total assets, to the removal of one of his important defences, such as activity. Whether a depression or a paranoid psychosis is produced is the result of the interplay of many forces, the constellation of which has a high degree of individual variation for any particular person. This can only be evaluated by careful individual psychodynamic study.

We therefore believe that any variety of psychiatric condition is possible, depending on the interaction of the physiological effects of these drugs, the psychological effect of this on the very complex defences, and the reality situation. It is naive to attribute these effects to some possible vague specific action of these agents on the brainstem,[6, 7] since the physiological effects of these drugs are fairly constant for any one dose and were also present in patients who did well on these agents. As another example of this, Case 16 shows a good result, i.e. beneficial to the patient, from the physiological effects in holding this man down, because he feared eruption of his aggressive feelings. It is probable that the same man would have been threatened instead of supported in other circumstances than these, because of his fear of passivity.

SUMMARY

A study of 14 cases of psychotic reactions, further psychotic deterioration or enhanced anxiety, produced with reserpine and chlorpromazine, is presented. Two other examples of the same psychodynamic elements, with benefit, are presented in contrast. We believe this to be the first work to deal specifically with psychiatric cases and offer explanations for this phenomenon.

All these cases had common psychodynamic elements.

The physiological effects of the drugs were fairly constant for a given dosage and were present both in those patients who reacted badly and in those who did well on these agents.

It is felt that these untoward reactions had nothing to do with the physiological effects *per se*, but rather with the way in which the physiological effects *psychologically* threatened the patient.

The psychological reaction produced was nonspecific as regards the drug but specific as regards interaction between the physiological effects and the particular psychic, interpersonal, and reality factors in the patient concerned. Thus any variety of psychiatric nosological entity is theoretically possible.

This paper presents some psychodynamic criteria from which clues as to the proper selection of cases have been deduced.[10]

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RÉSUMÉ

Les auteurs présentent une étude de 14 cas de réactions se rapportant à la psychose, de détérioration psychique augmentée ou d'angoisse accrue, produites par la réserpine et le chlorpromazine. En contraste, ils présentent deux autres exemples des mêmes éléments psychodynamiques qui ont bénéficié du traitement. Les auteurs croient que leur étude est la première à traiter spécifiquement des cas des psychiatrie et à offrir des explications de ce phénomène.

Tous ces cas présentaient des éléments psychodynamiques communs (voir le texte).

Les effets physiologiques de ces médicaments furent assez constants pour un dosage donné et se rencontrèrent chez les malades qui réagirent mal et chez ceux qui bénéficièrent des médicaments.

On suppose que ces réactions fâcheuses n'avaient rien à voir avec les effets physiologiques per se, mais plutôt se reliaient à la manière dont les effets physiologiques menaçaient le malade *psychologiquement*.

La réaction psychologique produite ne fut pas spécifique au médicament, mais le fut à l'action réciproque des effets physiologiques d'une part, et des facteurs particuliers psychiques et personnels et de la réalité concrète propres au malade concerné d'autre part. Ainsi, n'importe laquelle variété de maladie mentale est théoriquement possible.

Ce travail présente quelques critères psychodynamiques desquels on a déduit des indices servant à identifier correctement les cas. M.R.D.

"COIN" LESIONS OF THE LUNG

There are as many definitions of the term "coin" lesions of lung as there are reports in the literature. Some writers state that a "coin" lesion has no size limitation, and that this terminology may be used if the lesion is well circumscribed. Others state that a limitation of size is necessary. In the current investigation, 124 such lesions were studied, and the criteria for inclusion in the series were: (1) diameter between 1 and 4 cm.; (2) well-circumscribed tumour; (3) lesion surrounded by lung; (4) no evidence of major bronchial obstruction.

In the previous literature, 729 such lesions have been reported, and 262 (37.31%) of this group were malignant. Among 124 "coin" lesions reported in the present study, a much higher cancer incidence was found (52.4%). Malignancy was much commoner in lesions in patients over 40 years of age—a very important point, deserving of considerable emphasis. Most "coin" lesions do not cause symptoms; an accurate diagnosis can be made by clinical and laboratory procedures in *less than one-quarter of all cases.*

Since exploratory thoracotomy is no longer considered a "dangerous operation", it is recommended as a diagnostic procedure when other measures fail to provide a convincing definition of a particular "coin" lesion.—W. B. Ford *et al.*: *Am. Rev. Tuberc.*, 73: 134, 1956.