

may exercise a bearing on the case, and that is that all or nearly all cases of multiple arthritis show a complete absence, or a much diminished percentage, of hydrochloric acid in the gastric juice.

The absolute or relative achlorhydria probably acts by the permitting of secondary intestinal infection. Organisms which gain entrance to the stomach from dental or faucial infection are normally destroyed or inhibited in the acid medium of the gastric juice. In achlorhydria they gain access in greater numbers, and in a more active state, to the alkaline medium of the small intestine, which is eminently favourable to their growth, and in which they multiply exceedingly, more particularly if there is any degree of intestinal stasis present. The presence of secondary intestinal infection probably accounts for the unsuccessful results which follow dental extractions or tonsillectomy in cases which are not treated in the earliest stages.

Turning to the other great group of chronic arthritis, viz., hypertrophic or osteo-arthritis, as exemplified by the senile hip, focal infection appears to exercise little or no influence whatever. Osteo-arthritis is a purely degenerative condition, associated with arterio-sclerosis and malnutrition of the joint, the actual determining factor being injury or strain. It is quite possible that the osteo-arthritic joint may become secondarily infected by organisms of very attenuated toxicity. Such a proposition is very difficult either to prove or disprove, but in any case focal infection plays a very subsidiary and unimportant role in the history of the disease.

Mr. T. C. GRAVES (Birmingham).

FOCAL SEPSIS AS A FACTOR IN THE CAUSATION OF MENTAL DISORDER.

Whilst observing the effect of the administration of calcium on the circulatory disturbances associated with mental disorders I noted [1] that in some cases there was a coincidence in the improvement affecting the circulatory and mental states with the development of a more active purulent reaction around septic foci, and removal of these foci was followed by a greater stability of the circulatory and mental states [2]. These observations correlated the work of Grove and Vines, of Cambridge [3], and of Henry A. Cotton, of Trenton, New Jersey [4].

Time does not permit of a lengthy examination of the many aspects of this problem. I will, however, offer some evidence on the subject by means of lantern slides illustrating some types of septic foci found in the mentally disordered and a few photographs of cases showing results of treatment.

(I) *Does focal sepsis exist in association with mental disorder?*

(1) The usual periapical rarefaction around the apex of a crowned and root-filled tooth in a non-certified case of acute depression. Full recovery followed the removal of this and other infected teeth.

(2) The growth of a similar area of rarefaction around the apex of a stump. This second film was taken a year later than the first, and shows that the rarefaction has become larger—from a case of delusional psychosis.

(3) A large dental infected cyst around the apex of a stump.

(4) Shows more infected stumps with areas of bony rarefaction around them—from a case of depression and continued confusion, with an absence of free hydrochloric acid in the gastric juice.

(5) Areas of rarefaction in the upper jaw around the roots of teeth where crowns had been shorn off in order that a denture could be fitted over them—from a case of melancholia.

(6) An abscess extending into the bone around the root of a stump, together with other areas of rarefaction around stumps—a case of confusion with excitement; the patient improved after dental treatment and was discharged.

(7) A series of roots with areas of bony rarefaction around them.

(8) The same in closer detail from a case of apparent dementia in a woman, but showing improvement following their removal.

- (9) Similar rarefaction areas in the jaws—from another case of depression.
- (10) An area of rarefaction around the roots of a carious molar—from a case of confusion.
- (11) Pyorrhœic change in the bone from a case of myxœdematous psychosis.
- (12) A further development of the pyorrhœic process around the teeth of a man, the subject of grandiose delusional psychosis. Following removal of these he recovered and was discharged.
- (13) The lower incisors of a man the subject of uncertified acute melancholia with suicidal intent and ideas of unworthiness, which disappeared after removal of the affected tooth. The film shows the complete isolation of the incisor by the pyorrhœic process.
- (14) Two molar teeth with areas of rarefaction extending down into the bone to the inferior dental canal—from two cases of mental disorder.
- (15) Complete isolation of a solitary incisor tooth, the ulcerative process extending deeply into the upper jaw, and on the same side an infected antrum containing flocculent fetid pus of mixed bacteriology, part of a pansinusitis and ethmoiditis—from a case of myxœdematous psychosis with delusions of poisoning, &c.
- (16) Section of the thyroid of the same case—no acini are to be seen.
- (17) The condition of the mouth of a woman of 70 admitted in a state of confusion and extreme ill-health. Following the removal of the teeth she recovered, even at that age, and was discharged.
- (18) The fauces of a woman the subject of depression. The tonsils are enlarged and infected, and the posterior pillars are swollen with œdema.

These films and photographs have been submitted as a few of the types of the conditions found in oral and nasal sepsis met with in cases of mental disorder. For further information I would refer you to psychiatric literature and the report of the Board of Control for 1924.

(II) The next question is, "*What is the effect of surgical treatment of these foci?*" Interference with chronic septic foci may have two effects. The general and mental condition may become worse or better.

(a) *The Exacerbation Reaction*, if it occurs, becomes manifest within a few days of interference, and its duration and intensity are variable, dependent on the extent of the interference, the nature, duration and extent of the septic process and the resistance of the patient. As a general rule the exacerbation reaction is usually followed by an improvement which brings the patient to a much healthier mental and physical state than before the interference.

It is this exacerbation reaction which is responsible for the development of psychotic symptoms following surgical and dental interference in some patients who before operative measures are regarded as sane, e.g., following dental extraction, occasionally appendicitis operations and puerperal conditions.

(b) *The Improvement Reaction*.—Dependent again on the nature, duration and extent of the chronic septic process, the development of degenerative processes and the resistance of the patient, the elimination of chronic septic foci may result in an improvement which as a rule is not manifested until some appreciable time has elapsed and sometimes may not be definitely noted even until a year or more has passed.

I will now show some photographs from untouched negatives illustrating improvement following treatment of septic conditions.

(1) The first photograph shows the depressed facial appearance of a young married woman the subject of melancholia. Three carious teeth and a buried root were removed and some uterine endocervicitis treated.

The next photograph taken about three weeks later shows an improved facial appearance and the next one a fortnight later a still happier facial aspect. Catamenia, which had been in abeyance, returned. She was discharged recovered, having gained a stone in weight during about six weeks. Note the narrowing of the palpebral fissure on the same side as the carious teeth in the first photograph and its gradual diminution as shown in the later pictures.

(2) This set of photographs illustrates the improvement in a case of mania. The first

photograph is dated April 9, 1924, and the second May 7, 1924. The first shows instability, the second stability. In this case septic roots, carious and pyorrhœic teeth were removed soon after the first photograph was taken.

(3) The following series illustrates the improvement in a case of confusion and encephalitis lethargica following the gradual removal of seventeen septic roots and carious teeth and the copious administration of calcium by mouth and injection.

Admitted on June 12, 1925, he was confused, noisy, threatening towards the staff of the hospital where he had been previously under treatment, deluded in many ways, e.g., imagined he had cancer of the throat, that there was poison in his water. He was also the subject of auditory and visual hallucinations.

The first photograph, dated June 27, shows bilateral ptosis and a squint of the left eye—weakness of the external rectus—and the expressionless face.

The next photograph, dated July 20, shows the expressionless facies, bilateral ptosis still present; the squint has gone but the sclerotics are plainly visible beneath the cornea.

The next photograph, taken on August 7, shows more facial expression but the bilateral ptosis is still obvious.

The last photograph, dated October 5, is a complete contrast to the first. The ptosis is not noticeable and the facial expression is much more normal. The improvement shown facially was associated with a mental recovery.

On admission he weighed 6 st. 12 lb.; on discharge, 8 st. 5 lb., in October, 1925. Since then improvement has been maintained, he is back at work and weighs 9 st. 8 lb.

(4) The next series of photographs illustrates the improvement in a case of confusion with grandiose delusions in a girl of 17.

The first picture shows the condition on admission; the second following medicinal treatment shows her much improved but the subject of pathological mischievousness. The third, after operation by Mr. F. D. Marsh, for removal of septic tonsils and adenoids, a more sober facial appearance and a diminution in the size of the goitre easily visible in the second picture.

The next pair of photographs shows the improvement in appearance of a case of confusion with grandiose ideation following removal of septic tonsils by Mr. F. D. Marsh.

The next pair of pictures illustrates the improvement in a case following treatment of oral and tonsillar sepsis in a girl the subject of delusional psychosis. She recovered.

These are only a few examples illustrating the relation of chronic septic infection to mental and emotional disorders, and I am convinced that these chronic infective processes play a great part in the production of these disturbances.

REFERENCES.

- [1] GRAVES, T. C., "Colloidal Calcium in Malnutrition, Chronic Sepsis and Emotional Disturbance," *Lancet*, 1922, ii, p. 957. *Ibid.*, "The Relation of Chronic Sepsis to so-called Functional Mental Disorder," *Journ. Ment. Sci.*, October, 1923; and "The Incidence of Chronic Infective Processes in Mental Disorder," *Journ. Ment. Sci.*, October, 1925. [3] VINES, H. W. C., "The Rationale of Parathyroid Therapy," *Brit. Med. Journ.*, 1923, ii, p. 854, &c. [4] CORTON, HENRY A., "The Relation of Chronic Sepsis to so-called Functional Mental Disorder," *Journ. Ment. Sci.*, October, 1923 (gives an extensive bibliography).

Mr. G. A. PEAKE (Cheltenham).

I have had, amongst others, some few very interesting cases of mouth sepsis that are worth a passing note:—

Some twenty years ago a lady of good social position had what was then known as "Riggs's disease of the gums." It would now be recognized as an advanced and neglected pyorrhœa. Her teeth were all loose, especially the upper and lower incisors, covered with calculus, and her breath was very foul. She would not hear of artificial teeth because her "mother had never worn any." So I was not allowed to do anything except remove the calculus at intervals. One or two years after she first came to me pus began to form round the left upper central, which was quite free from caries. After the pus had begun to accumulate the pulp of this tooth died, with the usual pain (she refused extraction); this was followed by acute swelling, which rapidly extended up the left side of the nose. She complained of seeing dark spots on everything she looked at unless she covered the left eye. I sent her to an oculist;