We also submit that all these abnormal experiences are based on a single phenomenon, showing gradations in its mode of perception by the subject; or, in other words, that they all represent but different modes of perceiving abnormal derivations of thought. How, then, can we explain the various gradations? We think it is possible to do so by considering, in its simplest terms, the process of normal thinking.

Some part—the greater part—of normal *thinking* consists in the intangible, imperceptible linkage of elements which cannot be described in terms of known sensations. But there are superadded qualities in thinking which can be termed kinaesthetic and visual. Part of our thinking consists in the evocation of words and visual images. This is illustrated in the division of human beings into “verbalizers” and “visualizers.” It seems permissible, therefore, to assume that when some physical stimulus acts on certain areas of the brain to produce an abnormal thought—a hallucination of thought—such hallucination may present (a) as a thought—which forces itself on the attention of the subject, cannot be banished or superseded at will as in the manner of normal thought, but is nevertheless incapable of description in other terms than that of “thought”; or (b) as a visual or verbal image—of varying degrees of intensity, which the subject describes in terms of vision or hearing.

Summary

A comparison is made between certain hallucinatory phenomena or, more properly, the patient's mode of perceiving certain hallucinatory phenomena—in temporal lobe epilepsy and schizophrenia. The current popular definition of a hallucination, which implies the location of the abnormal perception external to the self, is criticized, and it is submitted that abnormal internal perceptions can also be included under the designation of hallucination. This designation, however, lacks precision, and it is hoped that in future more precise terms will be formulated to cover the many varieties of abnormal perception here illustrated.

Five cases of temporal lobe epilepsy are described in which epileptic discharge evoked respectively (a) ill-defined or “amorphous” thoughts, (b) formulated or “crystallized” thoughts, (c) a voice located in the head, (d) a voice located in the abdomen, and (e) a voice heard in the external environment. Cortical stimulation reproduced a, b, and e. Similar gradations in this type of hallucinatory experience, elicited from interrogation of patients suffering from schizophrenia, are briefly tabulated.

Four cases of visual hallucinations in temporal lobe epilepsy are described. In two of these the visual experience was apprehended within the mind of the patient, and in the third as superimposed on the external environment. (This last was reproduced by cortical stimulation.) In a fourth case the patient experienced the transformation of all his thoughts into vivid external images—“What he thought, he saw.” This bears a certain analogy to the phenomenon known as “*echo de la pensée*” found in schizophrenia.

It is submitted that these various gradations from “thoughts” to external auditory and visual hallucinations represent but different modes of perceiving abnormal derivatives of thought or hallucinations of thought. Since some part of normal thinking consists in the evocation of visual images and words, it is argued that a hallucination of thought may present either as a “thought” or as a visual or verbal image of varying degrees of intensity.

The finding that epileptic discharge and cortical stimulation can evoke gradations in hallucinatory experience

similar to those found in schizophrenia suggests that the latter disease may also have a neuro-physiological basis.

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CHRONIC PAIN IN THE RIGHT ILIAC FOSSA*

BY

S. H. WASS, M.S., F.R.C.S.

Surgeon, Guy's Hospital

Chronic pain in the right iliac fossa constitutes a common problem in all branches of medical practice. The correct management of the disorder depends upon careful clinical evaluation, and mistakes are easy to make. One common mistake is the tendency among many people to rush into the much abused diagnosis of a “chronic appendix” or, as the only alternative, to treat the patient as a “neurotic.” Either of these assumptions may lead to disastrous consequences, and to avoid such obvious pitfalls it is my practice to approach the problem of diagnosis by seeking the answers to three questions: (1) Is there an organic cause for the pain *apart from* the appendix? If not, (2) Is the appendix genuinely at fault? Or, (3) Is the pain of functional origin? This order of questioning has been chosen deliberately, because it often happens that the appendix is removed when some other cause for the pain is present, and because it too often happens that the appendix is removed without reasonable evidence that it is diseased. Functional affections, however, should always be considered last, because there can be no greater error than to stigmatize a patient “neurotic” when in fact organic disease is present.

1. Causes of Pain Apart from the Appendix

Let us first consider those organic causes of chronic pain in the right iliac fossa which are unconnected with appendicular disease. So that nothing of importance shall be omitted, it will be convenient to classify them on an anatomical basis.

(a) *The Caecum*.—There is no doubt that chronic pain in the right iliac fossa can arise in the caecum. It may be due to *gaseous distension*, when the area is tympanitic, gurgling is present on palpation, and excessive borborygmi are heard on auscultation of the abdomen. In older patients it must always be borne in mind that caecal distension may signify chronic intestinal obstruction due to a carcinoma of the pelvic colon, and every effort must be made to exclude this serious disease. *Loading* of the caecum with soft faeces, in association with constipation, may also cause chronic pain in the right iliac fossa; in these cases a characteristic doughy feeling is detected on palpation. Pain may also arise from caecal *spasm* accompanying general

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colospasm; tenderness is present over the caecum and often over a rigid pelvic colon in the left iliac fossa. In such cases propantheline ("pro-banthine"), a recently developed ganglion-blocking agent, is of great diagnostic and therapeutic value. *Malignant disease* of the caecum seldom causes pain as its first symptom.

(b) *The Terminal Ileum*.—Chronic pain in the right iliac fossa is rarely due to disease of the terminal ileum. *Crohn's disease* (regional ileitis) may give rise to an attack of acute or subacute pain closely resembling appendicitis, but in its chronic form it produces the symptoms of chronic small-intestinal obstruction with recurrent attacks of colicky pain in the right iliac fossa. Young adults are usually affected, and loss of weight is common. The thickened terminal ileum is usually palpable as a tumour in the iliac fossa. A similar history of recurrent bouts of colic occurs with localized *tuberculous enteritis*, but here no tumour is palpable. Both these diseases are rare, but they should be considered in the differential diagnosis of difficult cases.

(c) *Mesenteric Glands*.—Enlargement of the ileo-caecal glands is a common cause of pain in the right iliac fossa in children. Pain arising in these glands is due to inflammatory disease and may be tuberculous or non-specific. In *non-specific mesenteric adenitis* pain may be felt in the iliac fossa or in the umbilical region, and may be colicky in nature; there is no shifting of the pain as in appendicitis, and vomiting is rare. Tenderness and muscular guarding are present, but there is no true muscular rigidity. The glandular infection often follows a sore throat and there is usually evidence of chronically infected tonsils. *Tuberculous adenitis* is more difficult to diagnose with accuracy, although a positive Mantoux reaction in young children is suggestive. Radiography is of little use in diagnosis because calcified (healed) glands produce no symptoms. A pale fatty stool due to blockage of lymphatic vessels (*tabes mesenterica*) is evidence of gross tuberculous disease.

(d) *The Urinary Tract*.—Chronic *pyelitis*, *stone in the ureter*, and *hydronephrosis* may all cause pain in the right iliac fossa. Frequency of micturition almost invariably accompanies *chronic pyelitis*, and pus cells and organisms are present in the urine. Pain arising from a *ureteric calculus* usually radiates from the loin to the groin, but when a stone becomes impacted in the ureter the pain may be localized to the iliac fossa. In such cases a previous history of ureteric colic is of the utmost importance and the urine should be searched for red blood cells. Chronic or intermittent *hydronephrosis* may cause great difficulty in diagnosis when the pain is not felt in the loin, because associated urinary symptoms are usually absent. Careful bimanual palpation of the loin must be carried out, and in all doubtful cases the urinary tract must be investigated completely.

(e) *Female Pelvic Organs*.—Gynaecological conditions are a fairly common cause of pain in the iliac fossa, but the differential diagnosis of these conditions must rest with the specialist. The classical ovarian pain of "*Mittelschmerz*," spasmodic and congestive dysmenorrhoea, uterine fibroids, pyosalpinx, small ovarian cysts, and prolapse of the ovary come readily to mind. As a generalization it can be said that gynaecological causes of pain in the right iliac fossa should be considered only if the attacks of pain bear a definite relationship to the menstrual cycle, if there is some associated disorder of menstruation, or if a swelling in the pelvis is detected on rectal or vaginal examination. Pain in the iliac fossa associated with a vaginal discharge does not justify a diagnosis of salpingitis.

(f) *The Spine*.—Chronic pain in the iliac fossa may also arise from affections of the spine. A *psaos (tuberculous) abscess* will cause pain in the lower quadrant of the abdomen and will be associated with a palpable swelling, but backache is usually the first symptom and the lumbar spine will be rigid when movements are tested. *Congenital or acquired deformities and arthritis of the spine* may give rise to pain radiating to the iliac fossa, but a careful analysis of the pain will reveal its radiating character and direct attention to an examination of the spine.

A formidable number of causes of chronic pain in the right iliac fossa have now been discussed, but they must all be given careful consideration in the diagnosis of this symptom. Investigation must always include a detailed and accurate history, careful inspection and palpation of the abdomen, the performance of rectal and vaginal examinations, examination of the spine, and testing of the urine, both chemically and in the laboratory. If all these investigations are negative the next question must be posed—is the appendix genuinely at fault?

2. The "Chronic Appendix"

The term "chronic appendicitis" is misleading and is often used without any serious consideration of its meaning. Some people believe that chronic appendicitis is a clinical entity of common occurrence, others that there is no such disease. A well-known teacher has said that an honest surgeon up to the age of 35 would refuse to believe in the existence of chronic appendicitis; that between the ages of 35 and 40 he would wonder if it occurred but refuse to accept a fee for removing the appendix; and that over the age of 40 he would be convinced that it was indeed a clinical entity.

To try to understand the meaning of the terms "chronic appendix" and "chronic appendicitis" let us consider the common clinical syndromes which occur in appendicular disease. Apart from acute appendicitis, which we are not considering in this discussion, two definite clinical syndromes can be recognized—recurrent subacute appendicitis and recurrent appendicular colic. By *recurrent subacute appendicitis* we mean recurring mild inflammation. In the earlier of these attacks the pain begins in the epigastric or umbilical regions and settles down in the right iliac fossa; in later attacks this shifting character is often absent and the pain is felt in the iliac fossa from the beginning. Fever is slight or absent, but the tongue may be furred and the appetite lost; vomiting is uncommon. Examination of the abdomen during an attack will show tenderness and guarding in the iliac fossa, but no rigidity. Such mild attacks usually last for 12 to 36 hours and then subside, leaving the patient free of symptoms for many months or even years. With *recurrent appendicular colic* the pain is felt around the umbilicus, but tenderness and guarding are present in the right iliac fossa. The pain is spasmodic in character, often more severe than the inflammatory pain of mild appendicitis, and vomiting is common. There is no fever and the tongue is clean. The bouts of colic may last for a few days at a time, and the intervals of freedom between attacks are usually shorter than those between attacks of inflammatory disease.

In the intervals between recurrent bouts of appendicular inflammation or colic the patient may show no abnormal physical signs whatever. The diagnosis depends upon an accurate history and upon observations made by the practitioner during one or more of the attacks; the importance of such observations cannot be overemphasized, and without them the consultant may have great difficulty in deciding the nature of the attacks.

Recurrent subacute appendicitis and recurrent appendicular colic may be considered to represent two types of "chronic appendix," inasmuch as the appendix is repeatedly giving rise to trouble or "grumbling"; but cannot truly be called "chronic appendicitis" because this term implies persistent chronic inflammation of the appendix. It sometimes happens, however, that after repeated bouts of mild inflammation or colic there may be persistent pain and tenderness in the iliac fossa between the main attacks. To this state of affairs the term "chronic appendicitis" might reasonably be applied.

Lastly, we must consider those patients who complain of chronic pain in the right iliac fossa without any definite preceding "attacks" to suggest recurrent inflammation or colic. The pain of which they complain may show occasional remissions, but often it persists for weeks on end,

though sometimes occurring for only short periods during a day. Such patients may show localized tenderness in the region of the appendix but no other abnormal physical signs. Can they be said to be suffering from "chronic appendicitis"? These cases are certainly the most difficult to assess, but increasing experience soon tends to dispel any scepticism about the existence of this type of appendicular disease. We have all had our share of surprises in this field. Patients about whom we were extremely doubtful before operation have shown unexpected pathological changes in the appendix; others who have had an apparently normal appendix removed have been magically cured of their symptoms. In all such patients the history is usually vague and inconclusive. Diagnosis depends upon the single physical sign of persistent localized tenderness and upon our assessment of the type of patient with whom we are dealing; here again the general practitioner can be of enormous help to the consultant with his knowledge of the domestic and personal background of his patient. Clinical impressions of this type assume great importance when we consider that accessory aids to diagnosis are often of little value. Radiographic examination of the appendix is uncertain and its results are often equivocal.

From this discussion the position with regard to the various types of "chronic appendix" may be summarized as follows: (a) With a history suggesting *recurrent subacute appendicitis* or *recurrent appendicular colic* we are on safe ground in advising removal of the appendix. (b) A similar history followed by the development of persistent pain and tenderness in the right iliac fossa may reasonably be called *chronic appendicitis*, and here again appendicectomy can be safely advised. (c) *Chronic appendicitis* without a previous history of recurrent "attacks" of pain is a more difficult problem. Children should always be given the benefit of any doubt, but in adults the decision to advise removal of the appendix will rest largely upon the general practitioner's knowledge of his patient's character and his interpretation of the nature of the symptoms.

3. Functional Pain

Last of all we come to those patients with no evidence of organic disease apart from the appendix and in whom we are not satisfied that the appendix itself is genuinely responsible for their symptoms. Few patients with pain in the right iliac fossa are true malingerers, and if we are correct in assuming that there is no organic cause for their pain we are dealing with examples of the *anxiety state*.

These patients have genuine symptoms and need help, but great patience and tact are required if that help is to be given. It is surprising how often a sympathetic attitude will reveal a psychological basis for the symptoms, and sometimes the mere unburdening of his troubles will help the patient enormously. Some people are quickly assured if they are satisfied that we have made a thorough and complete examination and can convince them that there is no evidence of serious disease. Others are more difficult to manage and do not readily accept the idea that their pain is nervous in origin in spite of a completely negative examination and a series of negative investigations. The psychiatrist cannot help if the patient is uncooperative, and if our common-sense approach to the mental problem does not produce conviction we are likely to have a dissatisfied patient. But at all costs we must avoid advising appendicectomy in someone we know to be a true neurotic.

All too often such patients will continue to seek further opinions until they find someone who will remove the appendix, but we must not be responsible for such action if we consider it ill advised. It is better to lose a disgruntled patient than to have him return with the same pain after an operation to which we have agreed against our own judgment. It is also better to lose such a patient than to be responsible for that dreadful sequence of events which culminates in subsequent operations for adhesions or other mythical maladies and leads to the creation of a confirmed hypochondriac.

GENERALIZED HYPERTROPHIC OSTEOARTHROPATHY IN ASSOCIATION WITH BRONCHIAL CARCINOMA

A REVIEW, BASED ON 24 CASES

BY

THOMAS SEMPLE, M.D., B.Sc., F.R.C.P.Ed.
M.R.C.P.

AND

R. A. McCLUSKIE, M.B., F.R.C.S.Ed.

*From the Victoria Infirmary, Glasgow, and Hairmyres
Hospital, Lanarkshire*

During the past seven years we have encountered in the West of Scotland no fewer than 24 examples of generalized hypertrophic osteoarthropathy in association with bronchial carcinoma. As it would appear to be the largest reported collection of patients suffering from this fascinating syndrome, and because modern surgery may handsomely reward early clinical recognition, it seems to be an opportune time to review the known facts and some theories of pathogenesis.

While the literature on the subject of generalized osteoarthropathy continues to grow, there has been little increase in our knowledge of the cause and real nature of the pathological changes of this condition since the first known description by von Bamberger in 1889. Marie (1890) named the syndrome "hypertrophic pulmonary osteoarthropathy" and defined it as a "symmetrical osteitis of the four limbs chiefly localized to the phalanges and terminal epiphyses of the long bones of the forearm and leg, sometimes extending to the roots of the limb and flat bones and accompanied by a dorsal kyphosis and some affection of the joints." This description requires little alteration to-day.

Although Hippocrates (1923), as early as the fifth century B.C., had described clubbing of the finger-nails, it was not until late in the nineteenth century that von Bamberger and Marie drew attention to the changes in the extremities associated with certain diseases. The confusion existing prior to Marie's description is illustrated by a case described by Saundby (1889) as one of acromegaly: a man aged 37 with thickening of the hands and joints died after five months, and necropsy showed "a sarcoma of the left lung with caseating pneumonia, a discovery which could only be coincidental." His illustrations put beyond doubt that he had unwittingly dealt with a case of osteoarthropathy.

Numerous reports have appeared dealing with the association of arthropathy with a variety of internal diseases. These diseases have most frequently affected the respiratory tract. Chronic lung abscess, putrid bronchiectasis, and empyema, all now fortunately rare, predominated. Brooks (1913) and Locke (1915) pointed out that at least a proportion of cases of osteoarthropathy had a malignant chest lesion. We have found it in a patient with metastatic lung tumours, and it has been reported in association with such intrathoracic lesions as arteriovenous aneurysm of the lung (Adams *et al.*, 1944), fibroma of the visceral pleura (Price-Thomas and Drew, 1953), and benign tumours of the lung and chest wall (Van Hazel, 1940).