labyrinth. At this point, then, let us leave this type of inflammation and turn our attention to the chronic suppurative variety.

Here we have a different clinical picture in which polypi are usually absent, whilst crusts and purulent discharge take their place, along with a group of symptoms—pharyngeal, laryngeal, or gastric—due to irritation by or absorption of the septic secretion. It is clear to our mind that the ethmoidal cells are infected, though how extensively we cannot say.

We should therefore once again adopt our conservative attitude and by removal of the middle turbinate do our best to ensure efficient aeration and drainage. This may be followed some considerable time later, if necessary, by a limited morcellement of the area from which the discharge appears to come. Some cures undoubtedly result from these procedures, and it will be well to allow a fair margin of time for this to occur. There will inevitably remain a not inconsiderable residue of cases in which we have done apparently very little to alleviate the patient's symptoms. When this impasse is reached in either type of inflammation (and it is at this point that they converge and we may consider them together), we are confronted with the question whether to hold our hand lest worse befall or whether there is a possibility that a more complete surgical procedure may result in the eradication of the disease.

We are at the parting of the ways. The moment has now arrived when the thought of complete exenteration crosses our minds, and we may well consider what is the best way to achieve it. Several ingenious intranasal operations have been devised. Attention might be drawn to the merits of Mosher's method in which, beginning at the agger cell, the curette is passed through an anatomical void lateral to the main mass of the ethmoid, and, after hitching up against the anterior face of the sphenoid, breaks the whole ethmoidal capsule into the nasal cavity. This might be compared with Sluder's procedure, where the same result is achieved by two skilfully directed cuts with special knives, the one vertically from back to front beneath the turbinate, and the other horizontal from within laterally and just below the base of the skull.

Can these or any similar operation effect the desired object? After many years and extended trials of such operations I am driven to the conclusion that by no intranasal procedure that I know of can the ethmoidal labyrinth be completely exenterated.

It is for this reason that I wish to bring to your notice and in some way to urge the claim of an external operation. If, for the moment, I pass over the possible merit of any transantral operation such as that recently advocated by Horgan, it is merely because my experience of it is limited to so few cases.

More than twenty years ago, when I had the privilege of assisting Killian in some of his frontal sinus operations, I saw the ethmoid exposed through the external incision, but it was not until 1913, when I saw Dr. Coakley operate in New York, that I appreciated how much of the ethmoid could be dealt with through a very small external incision. Since that date I have practised a similar operation, in some ways modified and in some ways extended, in an ever-increasing number of cases.

I know that there is nothing new about an external operation; I merely claim that it has not been, and is not, performed nearly so often as it should be, and that in obstinate cases it gives a considerably higher percentage of cures than any other operation. I have employed it for fifteen years in purely ethmoidal cases, and, as I regard the ethmoid as the key to the frontal sinus, it naturally has formed the basis of my frontal sinus operation.

Through a very small incision in the delicate skin, just internal to the inner canthus, which leaves an almost invisible scar, practically the whole ethmoid can be dealt with, and particularly the fronto-ethmoidal and orbito-ethmoidal cells which are so often at fault, and which tend to keep up the ethmoidal disease. These cells cannot be safely and satisfactorily removed by the intranasal method.

If an infected high ethmoidal cell is found to be producing a mound in the floor of the frontal sinus, and is

affecting this cavity, it is the work of a few moments to remove a portion of the floor of the sinus, and thereby improve its drainage. Moreover, it gives excellent access to the cells of the superior meatus, and especially to that large posterior cell which is plastered on to the anterior face of the sphenoid and which so often remains unopened by any intranasal procedure. It is always quite remarkable to see how many cells remain unopened after what was thought to be a complete intranasal exenteration.

I do not wish to claim too much for this operation, for there remains a small percentage of cases in which apparently we cannot remove every infected cell, and these cases, though relieved, are not cured. I can only say that after an extended experience I regard this operation as of the utmost value, and the main point that I should like to make to-day is that, in well-established cases, the possibilities of the external operation should not be lightly dismissed or its performance unduly delayed.

THE HEREDITY OF DEMENTIA PRAECOX.

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PRACTICALLY all authorities agree that, in common with other varieties of insanity, some defect in the heredity of the individual is at all events a predisposing cause of the dementia praecox (schizophrenia) from which he suffers. Given this "predisposition" it is further generally assumed that some additional factor is necessary for the actual lighting up of the psychosis, and that this necessary exciting cause may be one of apparently very slight degree if the predisposition is intense. In spite, however, of the most eager statistical research into the histories of tainted and untainted stocks, we know at the present date no more than this about the etiology of dementia praecox. The difficulties in the way of any accurate conclusions are apparently insurmountable, and the results of the inquiries which have been made show little similarity the one with the other. The long intervals between human generations on the one hand, and the unreliability of "family" information on the other, are the chief obstacles to conclusiveness. Further, inquiry is obviously useless except among the educated classes, but here secretiveness as to any known taint is especially pronounced. Then, again, the question is unsettled as to what abnormality is to be considered a "taint"—many writers include genius, and some immorality!

Kraepelin¹ considered "with all reserve" that the disease, though often "familial," was the result of an auto-intoxication due to a "disorder of metabolism," basing his theory on the fact that the first symptoms tend to appear at puberty and adolescence, and his views have received support from the work of Mott,² Lewis,³ and Gibbs, among others. It may, however, be very reasonably contended that the degenerative changes found in the sex glands are secondary to some deeper and earlier defect in the organism.

My experience of the peculiar incidence of dementia praecox among the Parsees of Bombay compels me to the opinion that "inbreeding" is a very definite cause of the disease. By "inbreeding" I mean, as the dictionary puts it, "breeding in and in"—not merely the occasional mating of cousins, especially of those of the first degree. The experience of the ages has led to various rulings against the marriage of cousins. These have been many, but I would mention especially the prohibitions of the Levitical degrees, of the Roman Law, of the Council of Agde (A.D. 506), and of the Canon Law, as evidence of this experience, as also the enactments of many American States at the present time.

Clouston⁴ when discussing his "insanity of adolescence," which approximates to the more recently differentiated dementia praecox of Kraepelin, refers to its marked incidence in Newhaven, and to the notorious "frequency of insanity among the old families of the Society of Friends,

the most self-contained and virtuous of all religious sects," which, I may add, undoubtedly discouraged marriage outside the limits of the society. The conditions at Newhaven are similar to those of most remote seaside villages in Scotland and Ireland, in which dementia praecox is relatively common.

The Parsees constitute a small and very clearly differentiated group in the Indian population, and among them intermarriage with outsiders, and proselytism, are strongly discouraged. They are the descendants of the Persian Zoroastrians who came over in the eighth century on the conquest of their country by the Mohammedans. These settled in the small island of Diu off the south coast of Kathiawar, and the adjoining mainland, and gradually spread over the neighbouring districts of Kathiawar and Gujerat, being, as a rule, hospitably received, and their abilities utilized, by the Hindu and Mohammedan rulers of the States. To this day their language is Gujerati, which, owing to their activities, has become the commercial language of Bombay, far to the south. At first (and to some extent still) they were cultivators of the soil, but later on their peculiar aptitude for commerce came to the fore, and at present the Parsees are the richest race in the East considering their numbers.

In all India at present there are about 100,000 Parsees, and of these about nine-tenths live in Bombay Presidency (which includes Gujerat and Kathiawar), the remainder being scattered widely about India as traders in the principal towns. Their religion is a very strict monotheistic Zoroastrianism, popularly referred to as fire worship. In a short note such as this it is impossible to enter into the teachings of Zoroaster, but the faith inculcates sobriety and benevolence as first principles, with the prospect to the sinner of a very horrible hell or Eblis. The Parsee's chief occupation, as I have said, is business, and for this his capacity is notorious. I have never seen a Parsee beggar, and the large hospitals and similar institutions built by the liberality of Parsees in Bombay bear convincing evidence to their benevolence. From the Western point of view the Parsees are far more in touch with our civilization than any other Indian people, and a large proportion of their well-to-do merchants spend a good deal of their time in Europe. In their treatment of their womenfolk especially, they, of all Indians, approximate closest to European ideals. It is notoriously difficult to get at the correct family histories of mental cases in England, and I must confess that I found it impossible among Parsees, whose jealous family secretiveness is proverbial. Not only was one countered by denials of facts which one knew through other sources, but any inquiry on these lines was apt to be considered "insulting" to the family, owing, probably, to the partial absorption of European ideas. At the same time, I could not help noticing that a large number of my patients were closely related. The average Parsee can give one a list of his cousins to the fifth or sixth degree—if he so wills—and refers to all degrees equally as "cousins." As I have pointed out in my *Clinical Handbook of Mental Diseases* (Butterworth, 1925), the marriage of cousins is usual among the Parsees of Bombay, and this custom has gone on since they reached India in the eighth century. It certainly attains its object in "keeping the money in the family," though, owing to it, the Parsee population of Bombay city might now almost be considered as "the family." Of course it is possible that some families may not carry out this custom, but it is generally admitted by Parsees.

The original number of refugees from Persia could not have been very large, but the figures have been most variably stated, and I have not been able to find any reliable statistics on this point. Of the Zoroastrians left in Persia at the time of the eighth century migration, the descendants in 1923, according to Sir Percy Sykes,⁵ numbered only about 10,000, and he remarks in regard to the present-day Persians:

"Unfortunately the custom prevails of marrying cousins in order to prevent the property going out of the family, and also because a relation will naturally be happier than a stranger in the house of her mother-in-law. The results are very bad from a physical point of view, as has been proved in many parts of the world. Persians are loath to give up their old customs, and it is still usual for brothers to arrange intermarriage on the largest possible scale, cases being common of large families intermarrying entirely with their cousins."

Unfortunately there are no statistics of insanity in Persia, and those of India are not worth any consideration, being obviously inaccurate. I have, however, no doubt whatever that the incidence of dementia praecox among Parsees is peculiarly high. The following figures show the types of mental disorder in my last 100 Parsee admissions at the Central Hospital for Mental Diseases, Poona, and of my last 50 private cases.

	Hospital Cases.			Private Cases.		
	Male.	Female.	Total.	Male.	Female.	Total.
Dementia praecox...	35	17	52*	13	11	24*
Manic-depressive ...	11	6	17†	1	2	3†
Insanity with epilepsy ...	3	0	3	2	1	3
Dementia (secondary) ...	10	11	21	4	3	7
Paranoia ...	1	0	1	1	0	1
General paresis ...	1	0	1	2	0	2
Insanity due to ganja (cannabis indica)	1	0	1	—	—	—
Idiots and imbeciles ...	4	0	4	5	5	10
Totals ...	66	34	100	28	22	50

* Including all varieties.

† Including involutional melancholia.

In addition to the above I would note 11 cases of epilepsy and 15 of the psychoneuroses.

Some of the above cases grouped under secondary dementia were probably originally schizophrenics, but the history given was too vague for any such diagnosis. I was rarely consulted about cases of mental deficiency unless the condition was such as to warrant some hope of recovery or to require hospital care, but have seen many obvious defectives, incidentally, in Parsee families. Many of the cases grouped under other heads showed praecox symptoms, and the recovery rate suggests that these may have been really cases of that disorder.

The percentage of discharges as recovered among these Parsee hospital cases was 6, although the annual average for all classes was just over 50 per cent.,* and it was a common subject of inquiry among members of my staff as to why no Parsee ever recovered.

Though their admissions show a high proportion of dementia praecox I have no reason to think that insanity in general is especially prevalent among Parsees. Inquiry is very difficult, as most, even of the Parsee medical men, object to the term "insane" being applied to one of their race.

The incidence of dementia praecox among Parsees is peculiarly noticeable in India, as it is a comparatively rare disorder among Hindus, and is rarer still among Mohammedans. Among these two groups the disorder occurs mainly in the educated classes, or rather in the persons of boys who have undergone the intensive system of education or memory training by which only can an Indian hope to obtain admission to Government service. Next to the Parsees, the group or race incidence of dementia praecox is, in my experience, highest among the domiciled Anglo-Indian community.

I desire to bring to notice the fact that in the Indian Parsees we have an example of a sober and industrious race, sprung from a small community of Persian refugees of the eighth century, who have very rarely intermarried with outsiders, or proselytized, whose environment is far superior to that of most Oriental races, and who show a peculiarly high incidence of dementia praecox.

Of course I quite realize that, granted the facts I have stated, it will be argued that the "taint" must have existed among the original refugees. Such a view, however, simply "begs the question." However difficult it may be to obtain evidence of the original "taint," such taint is easier of proof than is, for instance, the conception that in the admixture of similar germ plasms lies the

* This high percentage is largely due to the high recovery rate of ganja cases, of which many were admitted from among the lower classes of Hindus and Mohammedans.

real cause of the trouble. It is curious that the majority of inquirers, who discredit the reputed ill effects of consanguineous mating, consider any suggestion of it similarly "begging the question," and this view of the matter is either ignored or derided by recent writers on the subject. The idea is, for instance, only touched upon at one point by Myerson,⁶ who writes:

"I scoff at the implication that because the paternal great-grandfather and great-grandmother were first cousins that we have any clue whatever to the gross defect in their great-grandchildren, their father and mother being superior people."

He would probably similarly scoff at the suggestion that the continuous mating of cousins—irrespective of any imaginary common "taint"—could tend to produce dementia praecox, but such a result is surely possible.

Some writers accept as ancestral "taints" such conditions as, for instance, heart disease, blindness, and neuralgia! These inquirers do not apparently realize that we are all imperfect, and that the fact of such imperfection in an ancestor is not, after all, a satisfactory proof of the likelihood of mental disease occurring in a descendant.

E. Rudin⁷ considers that dementia praecox is transmitted according to Mendel's law, and is increased by inbreeding. Myerson,⁶ after able analysis of many family groups, agrees with Rosanoff,⁸ Jolly,⁹ Luther,¹⁰ and Krueger,¹¹ and states that "dementia praecox breeds true . . . and in an ancestor is usually followed by dementia praecox in the direct insane descendant. Moral imbecility, feeble-mindedness, and epilepsy are also found in the descendants and frequently in combination with dementia praecox." In other words, he considers dementia praecox a Mendelian recessive character. The writers I have mentioned find, further, that insane descendants of persons who have suffered from the involution psychoses are cases of dementia praecox, as are also often the insane descendants of manic-depressives. As Myerson⁶ puts it, "All roads seem to lead to dementia praecox and from thence to imbecility. As the disease gets worse from generation to generation it ends in dementia praecox." Dementia praecox in an ancestor, on the contrary, does not appear to be a precursor of manic-depressive in the descendant, but as deterioration becomes more marked dementia praecox appears, and I can imagine no condition showing such obvious all-round degeneration as this syndrome presents.

If many of the original refugees had been schizophrenics, it is very doubtful if a Parsee race would now exist in India. But 100,000 do exist (among some 320,000,000 Indians of all races and classes), and include a large proportion of very able persons. At the same time most of those who become insane suffer from dementia praecox, and the custom of the marriage of cousins has persisted since the eighth century in this community, which is not a large one. Judging by the results obtained by Myerson and others, it is therefore probable that any original taint which, by its transmission through inbred generations to present-day Parsees, might breed in them dementia praecox, was itself a very much less serious form of mental disorder—if indeed it could be classed as such at all.

Our present-day differentiation of mental deficiency from insanity is surely merely one of convenience, and few will, I think, argue the impossibility of the consideration of schizophrenia as being a variety of the former rather than of the latter group of disorders. In most cases the degenerative tendency appears to be inborn in the individual.

As I have previously written, the disorder has a predisposing and an exciting cause. In the case of the Parsees the former is contained, presumably, in the heredity, but it is, I think, a question whether the heredity acts as a cause solely by means of an inherited taint or whether consanguineous mating in some way itself lessens resistance to the stresses of life, and helps to produce the disorders of metabolism that are possibly the most usual exciting causes of the breakdown. As White¹² puts it:

"Every individual born into the world has, if it could be determined, a definite potentiality for development. The force or the impetus which starts it on its path is sufficient to carry it a certain definite distance. In the subject of this disease the original impetus has been weak, and when its force is spent [mental] development stops and the retrograde process is hastened or initiated by some special physical or mental stress occurring at the critical point of puberty and adolescent evolution."

What is, however, the cause of the failure to carry on? Tredgold¹³ comes to the conclusion that feeble-mindedness results from a vitiated germinal vitality which prevents normal development, and most authorities are, as Myerson⁶ writes, "firmly convinced that there is a familial transference of certain types of feeble-mindedness, and there is very distinctly appearing the belief that these familial cases originate in injury to the germ plasm." One may perhaps speculate on the kind of injury he adumbrates. It is possible that "similar" germ plasms may be in some way detrimental to each other.

Most authorities insist on the view that the marriage of cousins conveys no danger to the offspring, if the common stock is sound. There is, however, no reason to suppose that the original refugees were in any way more unsound than any similar group, and, as no stock appears to be absolutely sound, the contention that consanguineous mating should ever be approved is very doubtful, as it must tend to intensify in the offspring any taint common to both parents. Nowadays at all events, the common Parsee stock is seriously tainted with dementia praecox, and the propriety of the abandonment of the custom of the mating of cousins should be definitely considered by them. Perhaps research into the results of such mating may be possible in some other field, but I am certain that little further result can come of inquiry in this one, unless it is carried out by a Parsee of an unusually altruistic type. The subject is one of immense importance sociologically and eugenically, as dementia praecox is the form of mental disorder which, owing to its relative incurability, keeps our mental hospitals full.

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AUTO-TRANSFUSION.

WITH THE ACCOUNT OF A CASE.

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ALTHOUGH auto-transfusion may often be the best and most readily available means of saving life in a surgical emergency it has not received the notice which it deserves, and the object of this communication is to draw attention to so useful a measure. Our interest in it was aroused by the following case.

A boy, aged 12, fell from the balcony of his home to the pavement beneath. He was perfectly conscious, although he had a very local fissured fracture of the skull, subsequently revealed by x-ray examination, and both bones of each forearm were broken. His pulse rate was slow. The abdomen was soft and not tender, and the patient assured us that he had received no injury in that situation. Under ether anaesthesia the fractures of his forearms were reduced. A few hours later signs of severe intra-abdominal haemorrhage definitely showed themselves. He rapidly became blanched and pulseless, and was in a desperate condition when brought to the operating theatre. The haemorrhage came on insidiously, because its early signs were doubtful and obscured by the other injuries and the anaesthesia.

Always ready in our operating theatre, even to the smallest detail, is what we call our "transfusion tray." Realizing the possibility and value of auto-transfusion in such a profound bleeding, this ready-to-use tray was requisitioned, and proved the great value of such a precaution, because of the short time at our disposal. The abdomen was opened by Mr. Devine, and found to be full of fluid blood containing a few clots; this was quickly ladled out and dropped into citrate solution. Meantime a vein had been opened by Dr. Kinsella, and reinfusion of the citrated blood was begun even while the blood was being removed from the abdomen. The source of bleeding was found to be a tear near the pedicle of the spleen. The abdominal wall showed no sign of trauma, the injury having been inflicted apparently in some indirect way.