STRUCTURE OF THE PERSONALITY IN PSYCHOTHERAPY *

BY

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Medical treatment by psychological methods is governed by certain guiding conceptions. In the older psychotherapy the leading principle is that of suggestion; in the more recent that of psycho-analysis. In neither is the study of the finer structure of the personality the aim. Suggestion can very well be practised as mass or group suggestion; in fact, frequently those suggestions are strongest and most effective which ignore the single individuality and bring it down to a common level. In the psycho-analytical schools it is the problem of experiences, their elaboration, transformation, and after-effects, which is in the foreground; the other half, the inner structure of the personality which is influenced thereby, receives little attention. It is not at this moment my purpose to state my attitude to all these various methods of psychotherapy, but rather to tackle the problem for once from the opposite side, to show it in the light of the personality and its inner biology.

The Meaning of "Structure of the Personality"

When we speak of the "structure of the personality" we have in mind, as the term implies, something more or less rigidly built up, a structure or a system of structures, a series of a certain number of "qualities" which can be defined in words and which manifest themselves in such and such a manner. This structure would have gradually taken shape and developed through the bilateral operation of the constitutional make-up and the outside world, particularly in childhood and youth. In adults it could figure as a fairly definite constant calculable factor, especially in those cases in which, in the course of psychotherapy, one has to study its typical responses to the outside world. This line of thought links up with the concept which would equate an individual's inherited equipment with that which is constant or fixed in his personality, a point I will refer to later.

The question, What is inherited in the personality? is indeed of fundamental importance not only for eugenics but also for psychotherapy, because, conversely, it is on this that the question depends: What has accrued to the personality from the outside, and can hence be modified by outside influence? But first of all an important question must be outlined more precisely. Generally one starts out from the tacit premise or equation, "psychogenic = responsive to psychotherapy"; in other words, everything that has originated by way of the psyche can also be removed by way of the psyche, and, conversely, all endogenously derived pictures are outside the scope of psychotherapy. Although these propositions, as applying both to the healthy and to the diseased personality, approximate to the truth they call for critical inspection.

The Negative Thesis in Psychotherapy

Already the negative thesis, "endogenous = non-responsive to psychotherapy," has proved to be not altogether valid. There are, however, optimists who state that schizophrenia can be cured by psychotherapy; I have never yet seen evidence of this in severe progressive cases.

It would imply that the schizophrenic process is reversible down to its roots by psychotherapy. But let us bear well in mind the difference between "reversible" and "formable." If we cannot bring about an involution of the endogenous elements of the schizophrenic process by psychic means we can nevertheless maintain that the form which it takes can be influenced by psychotherapy at every stage. This is especially the case when the endogenous process no longer shows acute progression. To-day it is no longer seriously contested that we have been regarding the schizophrenic symptoms far too much as a finished product, as it were, of the endogenous process. The more active treatment of patients, as it is now legitimately practised in mental hospitals, has shown that even the severe final stages can be modified; this means that complicated symptoms and powerful dynamic manifestations of the psychosis can be made to disappear partially through psychic influence, and that in their place responses can be produced which are nearer to those of healthy subjects. The pictures are therefore reduced to their innermost and truly endogenous nucleus, which is of course irreversible. This core or nucleus consists, in the first place, of certain operative patterns of the psychic mechanism, which may be regarded as constant not in the sense of being static but as representing a dynamic group of factors. How far these pathological tendencies of the psychic apparatus contribute towards the development of the related typical delusional ideas or psychomotor effects depends, within certain limits, on outside influences and hence also on a planned psychotherapeutic technique.

One might say such treatment is "only" symptomatic. The "only" is not, however, always appropriate in milder cases, since in our efforts in the realm of genetic biology we are quite exclusively concerned with the endogenous factor. But for the therapeutic result in the individual patient it can very well be decisive, whether a pathological factor develops into an outward symptom or whether it remains within the framework of an endogenous reaction tendency. This "only" can determine his fate; it can decide whether he will be socially incorporated or rejected.

All this becomes far clearer and more important when we leave the realm of the severe endogenous catastrophes and consider the milder borderline cases, the endogenously determined dislocations and variations of personality that are unaccompanied by psychosis. Consider, for instance, a schizoid psychopathy, one of the nuclear symptoms of which—autism—is manifestly rooted in the constitutional components of the personality. The intelligent young schizoid soon becomes aware of his peculiar inner sensitiveness, the resultant difficulties of establishing contacts, and his tendency to peculiarity; it becomes his problem in relation to himself and to the outer world. This problem is no longer endogenous but signifies a reactively determined psychic attitude. The personality becomes aware of its being different, it seeks form and adjustment. And at this stage psychotherapy can be of decisive help. Or it can depend whether the person finds his appropriate *modus vivendi et laborandi*, or whether he shrinks into himself to become a freakish eccentric. Similarly, increased difficulties during puberty are characteristic of the schizoid constitution; but whether or not he comes to grief in the collision with the parents is often decided by psychotherapy. Similarly there are certain appropriate kinds of milieu in which hypomanic or phlegmatic persons can lead constructive and productive existences; and, conversely, certain ways in which such persons can come to grief are determined by their constitution. Not the constitution in itself but the finding or not-finding of

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the appropriate milieu determines their destiny; and that is where psychotherapy comes in. It is a striking fact, discovered by Mauz in his work on epilepsy, that the clinically familiar explosive kind of epileptoid syndrome develops phenotypically chiefly among the lower social classes. The same endogenous disposition rarely manifests itself in that form among the educated classes; which means that the decisive symptom, the brutal explosiveness, fails to develop because it is inhibited by educational and environmental influences.

The Opposite Thesis

Now let us elucidate the opposite thesis: "Whatever has originated primarily as the result of external psychic stimuli must be regarded as curable by psychic means." But this thesis, too, is not so straightforward as is usually thought, especially in complicated, multidimensional formations. In the border-zones of schizophrenia or in non-typical depressions we encounter again and again individual cases which are precipitated by a severe psycho-reactive shock and do not develop as a typical psychogenic disorder; instead, their course is governed in accordance with endogenous, constitutional dynamics; and once this process has been activated the way back to the psychogenic (exogenous) levels is finally lost. Similar observations can be made in the field of paranoia—for example, in the case of querulents whose illness was clearly reactively determined or in severe cases of pseudo-dementia of long duration, or again in those rare cases of prison psychosis which become chronic. In all these fields abnormal developments of personality occur in which the equation, psychogenic = responsive to psychotherapy, does not properly apply. In such cases the admittedly reactive origin cannot fully account for the resultant psychic disorder; or, at least, a dynamic disproportion becomes apparent between the swift and facile psycho-reactive onset and the difficulties of resolution by psychotherapy.

Apart from these cases there still remains a psychotherapeutically unresolvable or hardly resolvable residuum, which can only be explained in terms of non-reversible processes in the endogenous structure of the personality. Such a process may take place before or after the onset of the psychic reaction. In the first case the psycho-reactive formations grow in the soil of a personality which has already previously undergone an imperceptible progressive change; this may often be observed in paranoiacs. If we study the past history of such a querulent prophet or inventor, we may come across a slight warping of the developing personality round about puberty for instance—no destruction, no endogenous psychosis, but an imperceptible endogenous change. From now onwards the psychic machinery begins to run in a different gear. Affective dynamics, sense of values, logical appreciation—all these are somehow changed; claims between the ego and the outside world are somewhat differently evaluated. From now on there is a new endogenous foundation on which a new secondary personality picture begins to take shape; but this second picture is not a definite finished product of an endogenous revolution. It is only that new dispositions, new modes of response, and new workings of the psychic mechanism have been created, which in their turn immediately begin their reciprocal action with the stimuli of the outside world. It is only from this reciprocal action that gradually, in the course of years, a new development of the personality, a new picture of the personality, takes shape, which we may term paranoiac, a picture that reveals certain religious, sociological, legal-

istic, or technically constructive activities which could not be observed previously. Once this endogenous basis has been established extensive reactive effects of strong emotional experience and of stimuli of the outside world become possible, just as in any other person; and they produce symptoms and mould the personality. Thus a new structure of the personality can originate which is emphatically understandable trait by trait in its development and the psychogenic origin of which is perfectly apparent. Sometimes it also responds to psychotherapy. But it is not so easily reversible as its obvious psychogenic dynamics might lead us to suppose, for the underground working of the endogenous moiety of the personality—as seen with the eye of the normal person—is slightly perverted, which makes the psychotherapeutic approach more difficult and renders relapses more likely.

Conversely, the endogenous dislocation at the constitutional level can begin only after the psychic reaction. Pictures of this type are specially obscure in the construction of their symptoms; they are prognostically incalculable and ambiguous as to their inner causal relations. I am thinking, for instance, of a few rare cases of severe pseudo-dementia of long duration which I have occasionally come across and which are referred to in the older literature on chronic prison psychosis. They begin, for instance, after an accident entailing damages, or under the threat of criminal proceedings: massive hysterical pictures, not far removed from malingering; the relation of the content to the precipitating psychic situation, the decidedly psychogenic type of the affective-dynamic situation, and the tendentious coloration of the whole picture are very striking. Some cases of that kind do not remain fully psychoreactive: if one re-examines them years later the outward appearance is in the main almost unchanged, but it now produces a dull, petrified effect. The claim for compensation is maintained; but there is an absurd disproportion between the gain that can be anticipated and the severity and duration of the sacrifice of every form of vital interest. No longer can we detect a powerful inner reaction to a situation that has been tackled with hysterical vigour, nor the ingenuity of true malingering, nor yet the drive of genuine querulousness. Behind the hysterical façade we encounter a grave loss of vitality manifesting as hypochondria, a chronic loss of elementary drive and interest in work and recreation, such as no normal person could possibly simulate. There are cases among these which the critical observer can no longer fit into the framework of the merely "psychogenic" without his being able to detect the moment when the originally purely reactive picture changed its character or to specify the individual symptoms which constitute the change. We cannot say that at this point or at that point the hysterical reaction has been reinforced or superseded by an endogenous psychosis. Also we cannot say for certain what part causality plays as between the various factors. We can only say that behind an originally purely reactive disorder something else which is somehow connected with the endogenous vitality of the person has imperceptibly crept in. Finally, the divergence from the behaviour of an ordinary person in the same situation has become so great that it can no longer be fully explained even in terms of chronic hysterical habituation and facilitation. There are rare terminal pictures of this kind which make the patient appear no more capable of practical life than in the final stages of schizophrenia.

In view of their rarity the importance of such cases is not essentially a practical one. Their significance lies rather in the sidelights they cast on the dynamic principles of the human personality (in health and disease), and on

the intimate interplay of endogenous and psychoreactive forces. They also illustrate especially well the fluidity of the endogenous background of the personality throughout life, which, in psychic treatment, we too often forget in favour of an ostensibly rigid structure of the personality which is quite fictitious.

One could adduce instructive examples from the psychology of everyday life which reveal this interaction between psychic reactions to the outside world and vital losses of inner tension. If we consider healthy persons who have lived for a long time in forced seclusion, servitude, or in prison, we find that some of them are afterwards unable to find their proper place in a normal environment. It is said occasionally that they are "broken" in spirit. That is a sentimental expression, but it signifies something which is quite correct. The process, in fact, has a reactive origin, as a purposeful adaptation to an impoverished and oppressive situation, as a loss of "starch" in the personality, as a diminution of will and energy, as a limitation of interests and needs. One would expect that the personality, when relieved of the outer pressure, would spring back to its former position; but in some cases it fails to do so. Instead the patient finally exhibits a loss of vitality, a certain desolation and indolence which causes him to shrink in discontent from formerly valued activities. Similar pictures may be observed in persons who, without suffering from a serious physical illness, have been in receipt of a pension for many years which has spared them the struggle for life. When they lose this pension they are not only unwilling to work but sometimes lose the very ability to work: they have lost vital potentialities of activity which are never re-established.

A similar meaning attaches to popular phrases such as "to become soured," or "philistine." Dullness acquired in the long course of monotonous, unstimulating work, or by the atmosphere of a small town, occurs first as a reactive adaptation to the environment, which leads finally, through the co-operation of constitutional inner factors, to a definite loss of personal *élan*, which Möbius termed "physiological imbecility." Möbius believed that these phenomena only occurred in women, and in these soon after the termination of puberty. But, of course, the condition can be observed just as frequently in men if they are at all disposed towards it. Neither is the endocrine chemical process alone to blame, nor solely the "staleness" of professional life. Actually both are closely connected causally, and both together ultimately produce a changed attitude of the total personality, which then becomes unable to respond properly even to a change of environment, however stimulating. In other words, it has become unresponsive to psychotherapy.

What is Personality?

What we call a man's "personality" is merely a fictitious scheme which we can compare with what Schilder (dealing with the physical aspect) has termed "body schema." It is a schematic picture of the position, contours, and functional potentialities of its bodily parts which the ego necessarily visualizes, and which need by no means tally with the material facts and the neurological findings. Pain is felt and localized in the amputated limb just as if it still existed. In the same sense we can speak of the psychic side of a "personality schema."

The personality is not a real, tangible structure of constant properties, but a schematic abstraction of certain typical responsive tendencies, of a group of typical attitudes, trends, and vital aims which a person has hitherto generally exhibited and which one would expect

him to exhibit in the future. Both the environment and the person himself contribute to this abstraction.

The fiction of a structural fixed personality has a certain real basis—namely, the hereditary disposition or psychophysical constitution and the manner in which it usually responds to fairly constant environmental conditions. The constancy of both factors, constitution and environment, is responsible for the approximate correspondence between the schema of the personality and reality. But if, for example, environmental conditions change, they can produce reactive potentialities hitherto unrealized in the character picture, and thus give rise to novel transient or permanent character traits. We have only to recall the enormous increase of hysterical reactions in the hospitals during the war, hysterical traits which for the most part would never have declared themselves in an ordinary environment. Conversely, we are reminded of the examples of great spiritual strength which is only evoked by danger or idealistic devotion in persons who are ordinarily shy and timid. One cannot say that the one quality is genuine, the other only fictitious. Both are constitutional reactive potentialities in one and the same person. They only become character traits, however, when they are evoked and maintained by appropriate environmental stimuli.

But in order to maintain the fiction of a static picture of the personality the environmental factor and the constitutional factor must both remain constant. Does not the conception of hereditary disposition and constitution already imply this constancy? What is constant is the germinal disposition, in so far as it includes potentially all behaviour patterns realized in the course of a human life. But they are realized according to the special laws of organism, and not simultaneously and not all permanently. Consider an alarm clock which is set to go off at a certain time; this is a typical example of potential energy which is present from the outset but is only realized for a moment. The same applies to many factors of the germ plasm. The hereditary constitution of a person may, for instance, be so set that at 18 years an attack of schizophrenia, or at 48 a bout of depression, is released. Hence germinal constancy is not the same as vital constancy. This is true not only of pathological hereditary factors but also of the ordinary so-called qualities of character. One cannot say that this man is energetic; we do not know whether he will be so to-morrow. This depends neither on illness nor on old age. In some people the fluid energy oozes away in the ordinary course of events, never to return. The careful observer will frequently be able to detect parallel constitutional fluctuations: changes of weight, of hair-growth, of skin elasticity, of potency.

The imperceptible developmental disorders and losses of vitality are, as soon as one begins to pay attention to them, of fundamental significance in relation to the origin of many neuroses and to the entire field of psychotherapy. So far, then, we can say that the personality schema is consistent, whereas the constitution is more fluid. In other words, the notion which the afflicted person has of himself, of his aims in life, and of his potential activities remains as it was in respect to the demands made on him by his environment. But the constitutional basis of this fictitious ego has slid from under his feet, unknown to himself. He now goes on attempting to respond according to his personality as it was hitherto—that is, within the schema of his formerly typical forms of adaptation to the outside world. At this stage a discrepancy arises between the real and the fictitious personality, together with a maladjustment to the outside world, which favours the genesis of neuroses. Here are a few clinical examples.

Conflict between Real and Fictitious Personality

A woman now 38 years of age wandered from one sanatorium to another, a severe case of hysteria with frequent fits, astasia, and a craving for operation. Formerly she had done social work, and had then gradually given up. Experiential complexes or outside difficulties cannot be considered as causal. On the other hand, the following was ascertained. Coincident with the onset of her hysteria she lost 23 lb. in weight. Judging by earlier photos, her habitus had changed from puffy and pasty to being markedly asthenic. Her hair became prematurely grey. The autonomic nervous system was found to be highly labile, her pulse feeble, and her muscles slack. Had the endogenous change in this woman taken the form of a massive bodily disease she would probably not have developed hysteria, just as the severely wounded soldiers seldom did in the war. The neurosis therefore has the purpose of revealing a genuine, and in this case grave, vital loss of tonus in body and psyche. But it is a loss of vitality which owing to its gradual, insidious nature is unable to fulfil the function which every acute disease immediately fulfils—namely, to act as a signal for the readaptation of the aims of personality in relation to oneself and one's environment.

Our therapeutic task in this case is essentially different from that which one is accustomed to consider as usual in hysteria. First, crude measures, such as simple disciplinary measures and forcefulness, are contraindicated. Attempts of this nature, which do not take into consideration the variation of the constitutional basis, would only tend to deepen the gap between the patient's will and her ability instead of bridging it. Experiential psychoanalysis would also fail, because here the difficulties are not experiential but biological. The treatment should aim at a reconstruction of the personality schema, which is no longer adapted to the new biological situation, and at finding the capacity for performance which is still compatible with the changed constitutional level.

Similar cases, incidentally, can occasionally be observed in women in professional life during and after the climacteric—for example, a partially genuine and serious loss of vital tonus of endocrine origin which takes the form of hysteria because it does not present a big enough front to the outside world. Here is another example:

A 40-year-old teacher was admitted for treatment with litigation mania and hysterical hypochondria. He had been waging a fierce struggle with the authorities and the villagers, who were alleged to be undermining his health and honour and conspiring against his life. Formerly he was a valued teacher and an energetic organizer who helped with youth movements and showed himself well able to battle with the world. The time when these normal conflicts became morbid and delusional coincided with a gradual change of his bodily constitution—namely, a considerable increase in weight with endocrine distribution of fat. His condition was greatly improved by endocrine and dietetic treatment combined with psychotherapy. For more than a year now he has again exercised his profession without disturbance.

Cases of this nature serve to illustrate most clearly the intimate interrelations between endogenous and psycho-reactive factors in the personality. The schema of the combative organizing personality, which was well adapted to the original constitution, remains unchanged, whilst the serious constitutional endocrine-determined loss of vitality progressively saps more and more of its foundations. The patient still believes himself to be his former robust self, which he has long ceased to be. Owing to this discrepancy the healthy fighting man develops into the over-excited querulent.

Biological Fluctuations

Many of these biological fluctuations defy detection in the life of average persons because their mechanical

routine work discloses little of their actual personality. On the other hand, one is surprised by the frequency and force of these inner changes of vitality in mentally productive individuals, since in their case every activity is borne by the full force of the personality and rises and falls with it. Thus the change from productive to unproductive periods produces a sort of "life curve" which can assume various forms, whether approximating to the undulant "circular type," as for instance with Goethe, or taking the schizophrenia-like form, as with Hölderlin and Uhland, in which a tense mental productivity in puberty is followed by a breakdown, or at least by a certain dryness and dullness. All this can well remain within the framework of biological variation, and need by no means assume the intensity of a psychosis. We can observe in many poets and research workers how some potentialities are only realized in certain, maybe very brief, phases of life remaining purely potential at all other times—inhibited for decades and then bursting forth all of a sudden; or early elation may be followed by utter exhaustion or, after a number of dry monotonous years, revived and pulsating periodically right up to old age. This can only be comprehended in terms of the fluctuations in the deep biological background of the constitution, which bears all outward developments of the personality in its wake and itself is changed.

Thus it can be shown how in the seemingly stabilized zenith of life in full swing, the personality can be affected in the absence of true disease or psychosis, by imperceptible shifts of its endogenous foundations, sometimes by favourable clarification, but sometimes by severe loss of substance. Every shift within what we have described as the constitutional radical of the personality—as, for instance, coloration of mood, impulse, stimulation, inertia—forces even the healthy person to a fundamental revision of his personality schema. When this is not possible on internal and external grounds, then there is always a possibility of psychogenic complications and of abortive attempts at pseudo-adaptation. Here, where the constitution changes and the environment remains constant, the danger of neurosis is just as great as in the far more obvious cases in which much altered environment acts on a constitution that has remained constant, as, for instance, in wars and catastrophes. In both cases the effect is the same—namely, the disturbance of adaptation between a constitution and its surroundings.

Critical Periods

What we have just described occurs most markedly and clearly in those phases of life at which every individual has his critical constitutional turning points; hence, above all, in puberty and during involution. Persons of thoroughly healthy constitution usually pass through these critical periods comparatively smoothly. In puberty, for instance, the psychic changes at the instinctive level harmonize with the process of physical maturation: the detachment from the parents; the gradual fusion of the individual components of the sexual impulse, its control and inhibition. On the basis of this instinctual metamorphosis the entire personality schema, with its performance, aims, ideals, and the demands of the environment, undergoes a parallel and harmonious reconstruction.

Every constitutional disturbance in the course of bodily maturation reveals to the careful critical observer corresponding irregularities in the instinctual metamorphosis. The individual psychosomatic signs of puberty become "asynchronised," no longer combine properly. This in turn results in discrepancies between the radicals and the personality schema, which manifest themselves as ambi-

valent attitudes of the youth towards the most important aims of life and the demands of the environment: again, a lack of balance within the personality and the environment. It is for that reason that disturbed and retarded pubescence gives rise to a number of neuroses in the post-pubertal period, especially between the ages of 20 and 30. I have dwelt on this on a previous occasion.

Conclusions

What bearing has this clinical approach on psychotherapy? The change is just as far-reaching as was that from the suggestive to the analytical method of treatment. At that time it was discovered that the suggestive removal of the neurotic phenomenon was merely a cure on the surface, because hidden behind the neurotic symptoms were emotionally toned experiences which had to be tackled therapeutically. The physician turned from the symptom to the experience. To-day we turn from experience to the personality. Without underrating the part played by certain powerful individual experiences, and, above all, the therapeutic value of an undogmatic experiential analysis, I and my collaborators have come more and more to regard individual experiences, both infantile and current, as only providing characteristic evidence, as though they were milestones marking the personality's path of development.

To-day we have come to recognize as essential the total structure of the personality and its relation to its surroundings *in toto*. Psychogenic tangles occur in the first place when the personality becomes disunited within itself or in relation to its environment—in other words, when the constitution and the personality schema, or the personality and the demands of the outside world, are in conflict. Thus the complicated psychological phenomena of neurosis are ultimately referred back to the clear clinical basis of our established fundamental concepts of natural science, to instinct and constitutional radical, to the problem of the struggle for life and adjustment to the environment.

The function of the physician in dealing with a patient suffering from a psychogenic disorder is therefore to study carefully his present-day constitutional make-up and personality structure in relation to all the significant conditions of his milieu, and to bring them to the consciousness of the patient sympathetically and truthfully. From the existing material, however rich or poor it may be, an in itself intelligible and genuine picture of the personality will have to be constructed and brought into a tolerable relation with the environment, which itself may require to be ameliorated by active interference on the part of the physician. Thus the biological adjustment—in other words, a new and tenable attitude to the struggle of life—is brought into being.

This biological approach can equally legitimately be made to apply to the psychic field. Only thus does the personality in itself acquire ethical value, and only through the elimination of sterile inner friction does it attain its highest efficiency in the service of the community.

The fifth Congress of the Societas Oto-rhino-laryngologica will be held at Bucarest under the presidency of Professor Metzianu on September 16, when papers will be read on indications for operation in acute and chronic mastoiditis, oto-rhino-laryngology in the medicine of tomorrow, a new method of radical operation in otitis media, and surgical diathermy in oto-rhino-laryngology. The subscription is 100 francs. Further information can be obtained from the general secretary, Dr. Chavanne, 5. Place des Cordeliers, Lyons.

THE CHEMICAL DIAGNOSIS OF EARLY PREGNANCY

A METHOD BASED UPON THE DETECTION OF OESTRIOL IN THE URINE

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In a recent article in this *Journal* Crew (1936), when discussing laboratory tests for the early diagnosis of pregnancy, briefly indicated the need for a chemical test, and in mentioning some of the attempts that have been made to devise such a test commented upon their failure to provide trustworthy results. Two types of chemical reaction were specifically cited: (1) the histidine reaction, first introduced as a possible means of pregnancy diagnosis by Voge (1929); and (2) the Visscher and Bowman reaction (1933-4), the basis of which is somewhat obscure. The method of Schmulovitz and Wylie (1935) falls into a slightly different category from the above tests, because it is alleged to be based upon the chemical detection of the oestrogenic hormones which are known to be excreted in greatly increased amounts in pregnancy. It requires a great deal more urine than the other tests and a more complicated technique, but as it appeared to be developed from a sounder basis it was given a short trial in this laboratory. The method was abandoned, however, when it was found that the colours produced were not specific for the oestrin compounds, and, indeed, were far more intense than could possibly result from the hormone content of the extracts from which the colours were developed.

The New Method of Diagnosis

The method about to be described makes use of a similar basis to that which was theoretically adopted by Schmulovitz and Wylie. It is concerned, however, only with the oestriol content of the urine, the oestriol having been shown by Cohen and Marrian (1934) to be the predominating oestrogenic hormone in pregnancy urine, and present to the extent of five to ten times the amount of the associated oestrone. It utilizes, moreover, a more specific reaction for this hormone—namely, the Kober phenolsulphonic colour reaction, which has been so successfully developed by Marrian and his colleagues (1936) for the purpose of the rapid estimation of the oestrin compounds in late pregnancy urine, and also as a guide to their isolation of oestriol glycuronide from the same urine.

Having had considerable experience in the use of this reaction upon extracts from late pregnancy urines, I have attempted to adapt it to early pregnancy, where the amount of available oestriol was of course very much less and the proportion of interfering substances correspondingly greater. As Marrian has shown, the oestriol of pregnancy urine is present in the form of a compound with glycuronic acid, and before the active hormone can be isolated the conjugated form has to be broken down by drastic acid hydrolysis. This preliminary hydrolysis has the effect of markedly increasing the pigmentation of the urine, and certain dark products cannot be wholly eliminated in the course of working up the extracts for the oestriol reaction. In the final stage they give a darkish-brown coloration to the Kober reagent, which in early pregnancy urines completely masks the character-