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Chapter Eight

SOUL RE-EMERGES IN THE LABORATORY

One of the problems blocking the way to any attempt to demonstrate the existence of the soul as an autonomous reality was the fact that an early commitment to a purely physicalist view of the nature of man had led to an almost total concentration on the development of scientific instruments capable of dealing only with *physical* things. The scientific method depends on measurement: and measurement means that the object under review must be quantifiable. If it cannot be quantified, it has no place in the laboratory. "Soul-stuff" falls into this *verboden* category.

Search for method to study psychology

Theodore H. Savory stated the matter very clearly in 1936 when he said:¹⁴⁴

Mechanism is the backbone of scientific thought in biology, since in science we have to act as if the mechanistic theory of life were true, but we are in no way committed to it as a metaphysically valid statement. Scientific progress, however, can be made only by those who experiment as if mechanism is true.

It is seemingly impossible to quantify human behaviour. Thus psychology is doomed to remain an art of uncertain value so long as it depends upon introspection and observation only. There are no instruments yet designed to quantify the almost infinite variety and complexity of response of which the human psyche is capable.

¹⁴⁴ Savory, Theodore H., *Mechanistic Biology and Animal Behaviour*, London, Watts, 1936, p.20, quoting Joseph Needham, one of the leading embryologists of his day.

While the behaviour of the body is often *highly* predictable (and so encourages "mechanistic" interpretations), the response of the human soul very seldom is — which suggests it is not operating as a mechanism and therefore almost certainly does not arise as an outgrowth of pure mechanism in the first place.

But as Paul Weiss rightly observed, the trouble may be that we have not yet designed the right kind of research tools or methods:¹⁴⁵

Maybe our concept of our nervous system is equally inadequate and insufficient, because so long as you use only electrical instruments, you get only electrical answers; if you use chemical detectors, you get chemical answers; and if you determine numerical and geometric values, you get numerical and geometrical answers. So perhaps we have not yet found the particular kind of instrument that tells us the next unknown.

Obviously, we shall never even attempt to design such instruments if the *zeitgeist* of our time convinces us that there is nothing there to measure.

So psychology, finding its chief object of investigation was hopelessly unpredictable, turned to the only measurable thing that seemed even loosely related to conscious behaviour — namely, reflex activity. It was really Pierre J. G. Cabanis (1757 - 1808), the eighteenth century physiologist who appears to have initiated this trend, having become curious as to the significance of the spontaneous movements of bodies that had been guillotined! At any rate, the end result has been that psychology has tended to become little more than a branch of physiology.

Indeed, John Broadus Watson (1878 - 1958) who was the 'founder' of Behaviourism, declared flatly:¹⁴⁶

[Psychology's] sole task is the prediction and control of behavior, and introspection forms no essential part of its method. . . . The time seems to have come when psychology must discard all reference to consciousness.

¹⁴⁵ Weiss, Paul, in discussion of J. R. Smythies' paper, "Some Aspects of Consciousness" in *Beyond Reductionism*, edited by A. Koestler and J. R. Smythies, London, Hutchinson, 1969, p.252.

¹⁴⁶ Watson, John B. "Psychology as the Behaviorists Views it", *Psychological Review*, vol. 20, 1913, p. 157, 163.

By this bold proposal, Watson seems to have hoped to re-establish the status of psychology as a *bona fide* science. But soul may simply not be a subject of enquiry amenable to the scientific method. Requiring so much subjective introspection, it seems to involve methods which are entirely foreign to the objective stance ideally claimed by the scientist. However, there is no reason to suppose that the "scientific" method of enquiry is the *only* route to understanding just because it has proved so successful elsewhere. It has not proved successful in matters of the spirit, and that is *all* that has been demonstrated: not that the matters of the spirit are of no account! But does this mean that we should frankly abandon the concept of soul altogether?

It has been said — and rightly, I believe — that with Descartes psychology lost its soul and found its mind: with the British Empiricists, soul lost its mind and found its consciousness: with Watson and the Behaviourists, soul lost its consciousness and found its reflexes. Thus, we have reduced man to a mere machine: we have annihilated the dignity and worth of man entirely. So an old man becomes an old machine, which is simply scrapped as worthless. Is this what the scientific method requires us to do with human personality?

Dichotomy vs. dualism

Now, it is important to bear in mind the difference between Descartes' concept of *Dualism* and the Christian concept of *Dichotomy*. In the strictest sense the dualist splits man's constitution in two and makes it possible to study each component separately and then to add the two together for a complete understanding. We accept the principle here that *one* and *one* makes *two*, but we entirely overlook the true meaning of the little word *and*. The dualist merely adds: God *fuses*. When one and one are fused, they make *ONE*! Thus the dichotomist views man as a single whole resulting not so much from the mere co-operation of two separate realities as from the complete *fusion* of them. James 2:26 states that the body "without the spirit is dead", and Thomistic psychology carried this further and said that the body without the spirit is not even a body — it is merely a corpse, a collection of molecules. But Descartes had unwittingly encouraged the view that the body was the whole man, a view reflected in our habit of using such terms as "some-body," "every-body," "no-body," etc., meaning "some man," "every man," "no man." It was, in fact, the annihilation of man as such.

Yet, as the course of psychology has tended towards matters purely physiological, the course of physiology is now tending in the opposite direction! Taking man's body as a machine, the re-discovery of the "*ghost* in the machine" has been the work of students of the machine, not students of the ghost. . . . And these "students" have been largely pupils of Sherrington — in particular, such men as Wilder Penfield of the Montreal Neurological Institute in Canada who died recently,

and Sir John C. Eccles, now retired after a lifetime as a neurophysiologist in England and the United States, and a Nobel Laureate presently living in Switzerland.

The brain: a machine?

Let us therefore consider, very briefly, the extraordinary work of Wilder Penfield, a man who performed an operation on more than a thousand epileptic patients that is probably more dramatic in its nature and outcome than even a heart transplant, and almost certainly more remarkable in the permanence of its effectiveness. The operation involves exposing part of the brain by turning back a rather large flap of skin on the scalp, cutting a segment of bone away to permit full view of a substantial area of the brain surface. The most critical part of this delicate procedure has to be performed under local anesthesia which means that the patient is fully conscious during the subsequent surgical probing that is required! Penfield himself observed that there is probably no operation that a surgeon ever undertakes which involves greater need for absolute trust on the part of the patient in the doctor and for the closest possible rapport between the two.

The secret of success in this most delicate of operations is therefore dependent on the remarkable circumstance that it has to be performed under conditions which permit a continuous exchange of communication between surgeon and subject. There is no pain felt as the brain is gently probed with an electrode after being exposed in the suspected area of damage causing the attacks of epilepsy. But one can imagine the potential apprehension of any patient whose brain has been laid bare in this way: for despite the enormous care and skill of the surgeon, there is always the possibility of a fatal error in technique.

Penfield soon began to make what can only be termed extraordinary discoveries regarding memory recall. As he gently stimulated the surface of the brain with an electrode charged with a very small current, the subject would suddenly find himself or herself remembering long forgotten events of the past in such detail that it scarcely seemed possible that it was only a *memory*! Detail was so complete, so connected, so like a rerun of a film with colours, sounds, distances, and even odours (!), instantly re-experienced not as a vision or a dream *but as a present reality*. It was always highly specific and repeatable at will. Contact with one spot on one occasion was repeated over sixty times and produced the same scenario each time!

The *purpose* was not the exploration of memory; the purpose was to locate at what precise spot stimulation initiated the first sudden symptoms of an impending epileptic seizure. As soon as this locale of the problem was established, the object was then to render that particular spot inactive. No pain whatever was felt when this was done; but if it was done adequately, the seizures thereafter were greatly reduced in frequency, or ceased altogether. The open wound was closed and in due course healed. The hair grew back in, and the patient normally recovered without ill effect.

It was quite by accident that Penfield and his co-workers discovered the extraordinary specificity of area stimulation and memory recall. More importantly, in the present context, Penfield observed a kind of "double consciousness." Even in the midst of recall and reliving of the most dramatic scenes, the subject fully retained his or her awareness of all that was actually going on in the operating room at the same time! This remarkable fact suggested that there was both an immediate and directly autonomous *consciousness* or *mindedness*, but also a "recalled consciousness" engineered by deliberate manipulation of the brain by purely *mechanical* means that was not autonomous.

It requires superb skill to perform such an operation on a subject who is fully conscious, as well as courage of a very high order on the part of both patient and surgeon. Penfield had the ability to inspire the necessary confidence to make each patient feel at ease, and thus both willing and able to discuss freely what was being experienced during the operation. What can only be described as an awesome penetration of the individual's private world, became a joint adventure into an area of research by an entirely unexpected route; and the excitement was clearly shared by both patient and surgeon alike.

Yet brain more than a machine?

Penfield points out that his training in the tradition established by Descartes and his own determination to treat the body as a machine, profoundly influenced his earlier years under Sherrington. What he was soon to discover in the course of treating epileptic patients therefore came as a total surprise. What he expected to find was that the brain was a computer-like machine of the most refined sort. What he actually found was not merely a computer: he found an independent *mind* that was the *user* of the computer as well as being the initial *programmer* of it in a highly personalized way. There was somebody present who was able to manipulate the computer and to recognize and discuss what the computer was doing when it was appropriately activated. The programmer stood apart from his own computer-like brain, and excitedly talked about the signals it was displaying on its "screen".

And so, in due course, Penfield slowly changed his position, forced by the testimony of his own subjects and the repeatable evidence of his own experiments to acknowledge that man was *more* than a mere electrochemical machine. He thus concluded:¹⁴⁷

Throughout my scientific career, I, like other
scientists, have struggled to prove that the brain [i.e., the

¹⁴⁷ Penfield, Wilder, *The Mystery of the Mind*, Princeton University Press, 1975, p.xiii.

physical organ itself] accounts for the mind. But now, perhaps, the time has come when we may profitably consider the evidence as it stands, and ask the question: Do *brain-mechanisms account for the mind?* [emphasis his]. Can the *mind* be explained by what is now known about the *brain*? If not, which is the more reasonable of the two hypothesis: that man's being is based on one element, or on two? [emphasis mine]

The kind of evidence he repeatedly found as he developed his unique and highly successful method of relieving a large number of epileptic patients of their disease, is well attested in the following. It proved to be a kind of classic case that, when it was first reported, shook to its very foundations the current mechanistic view of the nature of human behaviour. He thus describes this particular incident in some detail because it marked a turning point for him:¹⁴⁸

When the neurosurgeon applies an electrode to the motor area of one side of the patient's cerebral cortex causing the opposite hand to move, and when he asks the patient why he moved the hand, the response is: 'I didn't do it. You made me do it. . . .' It may be said that the patient thinks of himself as having an existence separate from his body.

Once when I warned a patient of my intention to stimulate the motor area of the cortex, and challenged him to keep his hand from moving when the electrode was applied, he seized it with the other hand and struggled to hold it still. Thus one hand, under the control of the right hemisphere driven by an electrode, and the other hand, which he controlled through the left hemisphere, were caused to struggle against each other. Behind the 'brain action' of one hemisphere was the patient's mind. Behind the action of the other hemisphere was the electrode.

One hemisphere was acting as an autonomous mechanism triggered by an electric current: the other hemisphere was clearly being controlled by the "resident manager," the subject's own mind or will or soul — whatever term seems most appropriate. Clearly, the movements of the two hands were differently initiated *even*

¹⁴⁸ Penfield, Wilder, "Control of the Mind" in a symposium held at the University of California Medical Center, San Francisco, 1961; as quoted by A. Koestler, *The Ghost in the Machine*, London, Hutchinson, 1969, p.254.

though the same brain was being used as a medium in both cases One activity showed the brain to be a "mere machine": the other activity which opposed it bore witness to the "ghost" in the machine.

Penfield concluded his report of this particular incident by saying:

There are, as you see, many demonstrable mechanisms (in the brain). They work for the purposes of the mind automatically when called upon. . . . *But what agency is it that calls upon those mechanisms, choosing one rather than another?* Is it another mechanism, or is there in the mind something of different essence? . . . To declare that these two are one does not make them so. But it does block the progress of research. [emphasis mine]

Something else "finds its dwelling place between the sensory complex and the motor mechanisms. *There is a switchboard operator* as well as a switchboard" [again, the emphasis is mine] . Certainly the brain is in effect a computer: but no computer works without a programmer even if the original designer deliberately builds the programme into it so that it needs no further supervision. It cannot build itself and supply its own programme from scratch. The self uses the brain: the self is, as Viktor Frankl said, "conditioned" by the brain since it has no other means of operating its body, preserving its own memories, or even thinking about its own thoughts. But conditioning is a very different thing from causing.¹⁴⁹ As Penfield expressed it, it is proper to say that man *has* a computer but not proper to say that man *is* a computer. Man is more than a computer because he is more than an electrochemical machine.

Mind over matter?

In 1973 H. H. Kornhuber extended the evidence of the dominance of the mind over the brain by an elegant series of experiments.¹⁵⁰ He discovered that willing

¹⁴⁹ Frankl, Viktor, in discussion of J. R. Smythies' paper, "Aspects of Consciousness" in *Beyond Reductionism*, edited by A. Koestler and J. R. Smythies, London, Hutchinson, 1969, p.254.

¹⁵⁰ Kornhuber, H. H., "Cerebral Cortex, Cerebellum, and Basal Ganglia: An Introduction to their Motor Functions" in *Neurosciences: Third Study Program*, edited by F. O. Schmitt and F. G. Worden, Cambridge (USA), Massachusetts Institute of Technology, 1971, p.267-280. Some thirty years before this, Ralph W. Gerard had pointed out that after a chemically induced coma, during recovery, a man who wills to clench his fist may find

an action leads to a wide-ranging negative potential over the top of the brain, which builds up over an interval of as much as one second, until it eventually concentrates on the pyramidal cells that are appropriate for the willed action.

When an action is *willed*, the action is not instantly performed. Evidence shows that the self-conscious mind or soul works upon the neuronal machinery of the brain to generate the necessary impulse patterns and to organize them. Eventually the patterned neuronal operation "homes in" on the correct pyramidal cells in the motor cortex in order to bring about the desired action. On average (depending presumably on the complexity of the movement and perhaps also its familiarity) the whole preparatory process takes about 0.8 seconds and this long delay (long, considering that nerve impulses move along the nerve fibres at the speed of light) indicates something of the incredible complexity of the events taking place.¹⁵¹

Clearly we have here evidence of an active influence of the self-conscious mind upon the neuronal machinery which is the brain. The soul uses the body to effect its will within the framework of the physical world. Mind orchestrates brain. This is a far cry from making the brain the generator of mindedness! The body has a "mind of its own" even as the mind has a brain of *its* own. Each appears to be suited to the other. Each has a measure of autonomy: the mind is free to initiate, and the brain once programmed is capable of sustained "unattended" activity.¹⁵²

himself unable to do so. But then, having abandoned the attempt and a few moments later being instructed to move his foot, he will, to his complete surprise, suddenly discover that he has clenched his fist. In this instance, the neuronal machinery of the brain has taken much longer to organize itself to perform the originally intended action. The chemically induced coma has somehow slowed up the mechanism; whether in the brain itself or in the pathways to the muscles of the hand is not clear. ("The Scope of Science", *Scientific Monthly*, June, 1970, p.502).

¹⁵¹ The time taken between the willing and the action can be demonstrated quite simply. One person holds a dollar bill by the top edge. Another person, holding an index finger and thumb on either side of the bill without actually touching it, will then try to catch the bill as it falls when the other person, without warning, lets go of it. It often proves to be a difficult feat.

¹⁵² It is possible for an epileptic subject to perform highly complex actions characteristically in keeping with his or her known personality but without any consciousness — i.e., as an automaton. (See Wilder Penfield, *The Mystery of the Mind*, Princeton University Press, 1975, p.38, 390. This is possible, however, only to the extent that the *conscious* individual has programmed the computer-like brain to begin with. This clearly gives priority to *mind*, not to the computer.

Mind and brain: interdependent

After a lifetime of research in the field of neurophysiology, Sir John Eccles collaborated with the well-known philosopher of science, Sir Karl Popper, in the writing of a book originally titled *The Mind and the Brain* which was later changed to *The Mind and Its Brain*.¹⁵³ The change is small enough in respect to typesetting, but its significance should not be lost in respect to the implications.

This volume is somewhat unique in its structure, being in the form of a dialogue. Both authors conclude that man is a duality of something that is spirit and something that is body, although they differ on the origin of the *spiritual* component. Popper thinks that evolution could account for it, though he leaves it an open question. Eccles, whose knowledge of the anatomy and physiology of the brain is both firsthand and very extensive, does not believe the mind can have emerged in this way. He is convinced that it has somehow been introduced from outside.

At the end of the volume is what amounts to a transcript of one of their daily discussions. Eccles has this to say:¹⁵⁴

So I am constrained to believe that there is what we might call a supernatural origin of my unique self-conscious mind or my unique self-hood or soul; and that gives rise of course to a whole new set of problems. How does my soul come to be in liaison with my brain that has an evolutionary origin? By this idea of a supernatural creation (of the soul) I escape from the incredible improbability that the uniqueness of my own self is genetically determined. There is no problem about the genetic uniqueness of my *brain*. It is the uniqueness of the experienced *self* that requires this hypothesis of an individual origin of the self or soul, which is then associated with a brain that thus becomes *my* brain [emphasis mine]. That is how the self comes to act as a self-conscious mind, working with the brain in all the ways that we have been discussing, receiving (from it) and giving (to it), and doing a marvelous integrating and driving and controlling job on the neural machinery of the brain.

¹⁵³ Popper, Karl R. and John C. Eccles, *The Mind and Its Brain*, London, Springer-Verlag, 1977, p.472, 473.

¹⁵⁴ Eccles, Sir John C., in *The Mind and Its Brain*, London, Springer-Verlag, 1977, p.559, 560.

There is physiological evidence, therefore, that man is a dichotomy of body and spirit, each independent in origin but interdependent in function. The brain appears to be *essential* for the soul to give expression to itself and to act upon the world of matter. The soul appears to be *essential* for the body to function purposefully and so to direct its actions meaningfully.

Soul and body, or mind and brain (if one prefers), are somehow uniquely wedded and this "wedding" constitutes the individual. How each acts upon the other remains a mystery but the fact is experimentally demonstrable, and has a great deal of significance. Western man's medicine is discovering what other cultures have long been aware of: namely, that a distressed spirit can mean a sick body and a healthy body can contribute to the well-being of the spirit. As Proverbs 17:22 put it long ago, "A merry heart doeth good like a medicine."

Science cannot, of course, do any more than speculate about what happens to the soul when the body dies. But Eccles believes that *the very existence in the body of a guiding and ordering spirit which is not of bodily origin suggests the continuance of the spirit after the body ceases to function*. Yet it is important also to note that there is good reason to believe from what evidence we now have that *consciousness is somehow dependent on brain to express itself*. The question is not, therefore, **whether the disembodied spirit can persist but whether it can persist in a state of consciousness**. As he says (quoting A. Fessard), "There is much neurophysiological evidence that a conscious experience arises only when there is a specific spatio-temporal pathway of neuronal activity in the brain,"¹⁵⁵ i.e., there is no evidence of **consciousness** when there is no evidence of any electrical activity in the brain — a condition which is termed *cerebral silence*.

Eccles expresses the view that when death destroys the *brain*, the self-conscious mind "now finds that the brain that it has scanned and probed and controlled so efficiently and effectively through a long life is no longer giving any message at all. What happens then is the ultimate question." This does not signify the *annihilation* of the mind or spirit — the "ghost in the machine." It merely suggests that it is effectively silenced. It has no vehicle of expression, no *modus operandi*. The only answer must be a resurrected body, if the self-conscious mind or soul is to recover its appointed mode of expressing itself identifiably.¹⁵⁶

Thus "no brain" (through the destruction of the body) would seem to be necessarily equated with a "no consciousness" situation and therefore to require the

¹⁵⁵ Eccles, Sir John C., *The Brain and the Unity of Conscious Experience*, 19th Sir Arthur Eddington Memorial Lecture, Cambridge University Press, 1965, p.17.

¹⁵⁶ Popper, Karl R. and John C. Eccles, *The Mind and Its Brain*, London, Springer-Verlag, 1977, p.372.

resurrection of the body in order to guarantee to the individual a self-conscious state of being.

But it would be a mistake to suppose that the disintegration of the brain means the *annihilation* of the mind or soul. It may indeed leave the mind or soul without means of self-expression, but if it is re-united with some form of resurrected body it would, once again, be capable of giving fully conscious expression to itself and of recovering its own personal identity. By implication, it would seem to require also that the resurrection of the body must be a resurrection specifically of our *own* body — and therefore also of our own *brain*.

However, bodily resurrection is surely a matter of revelation, not of the logic of scientific evidence, a fact clearly demonstrating the limitations of the scientific method. This method has gone a long way towards filling out the picture, but theology which is based firmly on the revelation of Scripture is needed to make the picture complete.

The "ghost" in the machine

Two facts of importance in the present context have emerged as a result of this experimental evidence.

The first fact is that man is no longer to be considered as merely an electrochemical machine. Something variously identified as a "ghost" in the machine, or a self-conscious mind, or a soul, has been clearly demonstrated to exist as a reality in its own right. "Mind" is capable of acting upon the body by using the brain in order to give expression to its own will, and makes use of its body as a means of manipulating the physical world. Though of independent origin, mind or soul is evidently designed to act upon the world through the agency of the body.

The second fact is that there is an on-going *interaction* between this soul and its body, and this on-going interaction unifies the total activity of the person as an organism and gives its functioning both purpose and meaning and (in health) a certain "fit" which encourages the harmony of co-ordination between body type and temperament.

Edward McCrady states the case very effectively:¹⁵⁷

I, for instance, certainly have a stream of consciousness which I, as a whole, experience: and yet I include within myself millions of white blood cells which give impressive evidence of experiencing their own individual streams of consciousness of which I am not

¹⁵⁷ McCrady, Edward, *Religious Perspectives of College Teaching in Biology*, New Haven, Ct., Edward W. Hazen Foundation, 1950, p.19, 20.

directly aware. It is both entertaining and instructive to watch living leukocytes crawling about within the transparent tissues of a living tadpole's tail. They give every indication of choosing their paths, experiencing uncertainty, making decisions, changing their minds, feeling contacts, etc., that we observe in larger individuals. . . .

So I feel compelled to accept the conclusion that I am a community of individuals who have somehow become integrated into a higher order of individuality endowed with a higher order of mind which somehow coordinates and harmonizes the activities of the lesser individuals within me.

The multiplicity of freely moving components, each of which is designed to contribute to the whole, is somehow "unified" by the presence of the soul. When the soul departs, this unity is lost and the body begins to become disorganized almost at once. Eccles holds that the *unity* of our consciousness is actively *imposed* upon the body by the self-conscious mind as it surveys the constant stream of incoming signals and integrates the output.¹⁵⁸

These two components of man's constitution together fulfill the purposes for which each is evidently intended and form the "identifiable individual person." At the present time the evidence clearly suggests that there is no conscious existence that is not accompanied by cerebral activity of some kind. This seems to indicate that the soul can only express itself and identify itself through the agency of its brain, a circumstance which further suggests the necessity of a resurrected body in some form analogous to the present one if that identity is to reflect the individual's personality.

If the soul cannot be derived from the body as some kind of evolutionary emergent, we have to suppose its origin lies outside the natural order. This in turn invites the conclusion that it may have a future continuance that also lies outside the natural order, yet will function in some kind of vehicle of expression compatible with the form of its expressive functioning as developed in this present world.

Conclusion

The scientific view admittedly stops here. It has no further data save what may be supposed by logical extrapolation. Such extrapolations form at best the basis

¹⁵⁸ Eccles, Sir John in *Mind and Its Brain*, edited by Karl Popper and John Eccles, London, Springer-Verlag, 1977, p.507 f.

of a hope, but they do not bring the strong convictions which come to the Christian as the result of a faith engendered in the heart and mind by the Holy Spirit through the reading of the Word of God. We are fortunate to be able to learn about and reflect upon what the scientist believes in this respect, but it is a pity that attempts to persuade such men to learn about and reflect upon what the Christian believes about these things are almost always doomed to failure, not for lack of knowledge or intelligence but for lack *of faith*. The spiritual rebirth of the soul involves also a spiritual renewing of the mind (Romans 12:2¹⁵⁹), an experience initiated by God through his Holy Spirit — not by man through logical argument. When the mind has once been renewed, the situation is wonderfully changed and a whole new world of understanding is opened up to the believer. This new understanding is not at all unreasonable, granting its premises: it merely goes *beyond* the kind of reason that is based on currently accepted presuppositions.

➡ PROCEED



¹⁵⁹ “And be not conformed to this world: but by the renewing of your mind, that you may prove what is that good, and acceptable, and perfect, will of God.” Romans 12:2.