

NATURALIZING THE MIND

Ideas for a multidisciplinary reflection on the phenomenon of hunger

Franco Baldini

Abstract

Naturalizing the mind. Ideas for a multidisciplinary reflection on the phenomenon of hunger.

This essay begins from the observation of the difficulty of modelling the phenomenon of hunger in its entirety, a difficulty consisting in the impossibility of passing seamlessly from the somatic to the psychic aspect and vice versa. The reason for this difficulty is found in the fact that it involves some important epistemological problems such as the relationship between reduction and naturalization, the relationship between objectivity and ontology, the relationship between different objectivities and the constitution of the objectivities themselves. It is therefore considered that the Freudian metapsychological model – whose basic epistemological lines are revealed – is crucial in achieving a suture between the somatic and the psychic. With specific regard to the phenomenon of hunger, it is shown how a restoration of the Freudian notion of «self-preservation drives» is decisive for its satisfactory modelling from both a theoretical and clinical point of view.

Keywords: *hunger, self-preservation drives, formalization, somatic/psychic, metapsychology, objectivity, ontology, symmetries.*

I

It's an undeniable fact that neither neurophysiological nor psychobiological research are able to satisfactorily model the complex phenomenology which revolves around the hunger stimulus. In particular neurophysiologic dynamics do not theoretically line up with the sensation of hunger and this does not theoretically line up with eating behaviours; thus leaving many very significant lacunae.

II

In each one of these steps the problem is therefore always the same, i.e. the need to integrate the biological dimension with the psychological.

III

There are now two ways to envisage this integration:

- as the *reduction* of the psychological context to the physiological one;
- as the *naturalization* of the psychological context.

IV

It's important to understand that *reduction and naturalization* are two terms which are conceptually opposed given that naturalization implies the gnoseological irreducibility of one level to the other. As Domenico Parisi writes in his essay *La naturalizzazione della cultura* (The Naturalization of Culture), «Naturalizing X means examining how we passed from a world which did not contain X to a world which contains X. And believing that in order to truly understand what X is, it is necessary to reconstruct this transition. But returning X to nature and therefore naturalizing X, means also renouncing reductionism».¹

V

The concept of naturalization is incompatible with reductionism. This is because it is based on the theory of complex systems in which the characteristics of a system created by a high number of elements interacting in a strongly non linear manner are not deductable or predictable from the characteristics of the single elements and the rules which govern the interactions between them. Yet the history of the world is mostly made up of the emergence of new complex systems from pre-existing ones.

VI

In particular naturalizing means explaining how one level considered less primitive becomes relatively autonomous in relation to another which is considered more primitive.

VII

To state that the autonomy of one level in relation to the underlying one is relative, means that that level is inconceivable without the other, but also means that it is not completely explicable by the latter. In this regard we are actually speaking of «emergent properties».

VIII

This involves two distinct aspects:

- the relationship between objectivity and ontology;
- the relationship between different objectivities.

¹ Parisi, D. (1998), *La naturalizzazione della cultura*. [The English translation is ours.]

IX

These aspects are often confused. As I mentioned, it is a fact that objectivities are generative of other objectivities, for example Freudian metapsychology was made possible because from biology came the understanding of the excitability of the nervous system in the form of the reflex arc which in turn led to the founding concept of the drive. This has often led to the assumption that objectivity can constitute the ontology of that from which it derives, for example that neurophysiology constitutes the ontology of metapsychology, but this idea is not correct because it arises from the confusion between ontology and objectivity, i.e. the belief that it is possible to access the ontology underlying a particular objectivity when in reality there is an arbitrary passage from one type of objectivity to another.

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Regarding the first problem namely the relationship between objectivity and ontology, it should be strongly emphasized that in modern science gnoseology no longer points to ontology but instead to objectivity. Indeed reductionism confuses objectivity and ontology. It is quite conceivable that the ontology of nature is one, but this doesn't lead to conclude that scientific objectivity is also unique. Scientific objectivities are plural, and this stems from the fact that every well constructed scientific theory implies there are fundamental symmetries which define the gnoseological horizon.

XI

As Jean Petitot writes in his paper *Transcendental Aesthetics for Modern Physics*:

This determining role of symmetries in physics bestows a special status to the objectivity of physics, in opposition to whatever substantialist ontology of individual and identified beings which exist transcendentally as separate entities. This old Aristotelian metaphysical tradition is incompatible with modern physics. The objectivity of physics is transcendental in the sense that it's a «weak» objectivity which incorporates within its concept of object the conditions of access and the conditions of possibility to determine its objects. More precisely that which is accessible to theory, i.e. its positive content, is defined *negatively*, namely due to that which is inaccessible (because of the symmetries). The symmetries impose a self limitation to that which the theory is able to know. Stating that they are constitutive is equal to saying that what theory can know is determined by that which theory can't know, this is a basic principle that separates the objectivity of physics from all ontology.²

² Petitot, J. (2009), *Per un nuovo illuminismo*, pp. 296-297. [The English translation is ours.]

XII

It is my firm conviction what Petitot wrote on physics should be generalized and extended to every rational science, i.e. to every true science.

XIII

In this regard allow me to digress and quietly note that, as Matte Blanco had already merely glimpsed, Freudian metapsychology is the only psychological theory which includes fundamental symmetries and is therefore able to precisely define its own objectivity. This thesis is extremely important and must be adequately explained: Freud writes in his essay *The unconscious*: «To sum up: *exemption from mutual contradiction, primary process* (mobility of cathexes), *timelessness*, and *replacement of external by psychical reality* – these are the characteristics which we may expect to find in processes belonging to the system *Ucs*».³ All this has never been fully understood, it deals here very precisely with invariance:

- regarding all types of opposition and contrast which can be established at the level of thought (exempt from contradiction), and not only regarding logical contradiction⁴ as Matte Blanco mistakenly thought;⁵
- regarding time (timelessness);
- regarding transformations in the local configurations of cathexes (primary processes).

These are the first three aspects presented in the citation. The last of these is not self-evident and requires a brief explanation. Freud, when speaking of unreserved mobility of cathexes which manifests itself through the mechanisms of displacement and condensation, and which Freud calls primary process, of necessity implies that every possible local transformation of the cathexes is reversible, otherwise freedom would not be unconditional, but all reversible transformations are involuntary or rather they are symmetries. This property is the basis for the efficacy of psychoanalytic treatment in that, as Freud writes in *The Interpretation of Dreams*, «If a pathological idea of this sort can be traced back to the elements in the patient's mental life from which it originated, it simultaneously crumbles away and the patient is freed from it».⁶

These *three invariances make up the reality of the Id as nucleus of the unconscious or rather psychic reality*. In this regard Freud speaks of «substitution of the psychical reality for the material reality» which is the fourth aspect. He

³ Freud, S., SE, Vol. XIV, *The Unconscious* (1915), p. 187.

⁴ See Freud, S., SE, Vol. IV, *The Interpretation of Dreams* (1900), (First part), p. 318 and Freud, S., SE, vol. XIV, *Instincts and their Vicissitudes* (1915), p. 126.

⁵ See Matte Blanco, I. (1975), *The Unconscious as Infinite Sets*.

⁶ Freud, S., *The Interpretation of Dreams* (1900) (First part), p. 100.

writes in *The Interpretation of Dreams*: «[...] we shall have to conclude, no doubt, that *psychical* reality is a particular form of existence not to be confused with *material* reality».⁷

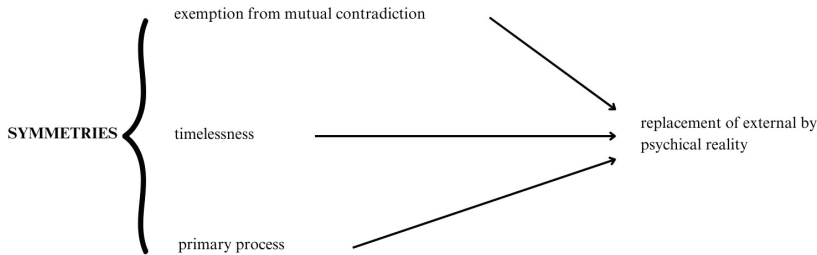


Figure 1

An in-depth study of Freud's works reveals furthermore that these fundamental psychic symmetries are not alone. It should be noted that what Freud nominates as «timelessness» implies not only a time translation symmetry⁸ but also a time reversal symmetry.⁹ Added to these should be a spatial translation symmetry,¹⁰ a symmetry of referral systems¹¹ and a rotational symmetry which will be discussed later.

Here we arrive at the crux of the matter. Freudian posterity has always seen attempts to understand the concept in terms of a deferral to the underlying ontology, for example in Laplanche and Pontalis the ontology of the psychic reality would be constituted by «unconscious desire and related fantasies». According to this interpretation the symmetries would be deferred to or explained by something more fundamental. However this is a serious conceptual error as the opposite is true, namely that it is the structure of unconscious desire which is explained by the symmetries. In fact the symmetries are the rules of its manifestation. In other words the symmetries make up the reality of unconscious desire and not the reverse. The concept of psychic reality doesn't defer to any underlying ontology in that it *has an exclusively formal content*; the Id comes down to nothing else

⁷ Freud, S., SE Vol. V, *The Interpretation of Dreams* (1900), (Second part), p. 620.

⁸ See Freud, S., SE, Vol. XXII, *New Introductory Lectures on Psycho-Analysis* (1932), pp. 73-74.

⁹ See Freud, S., *The Interpretation of Dreams* (1900), (First part), pp. 327-328.

¹⁰ See Freud, S., *New Introductory Lectures on Psycho-Analysis* (1932), pp. 25-26 and Freud, S., *Instincts and their Vicissitudes* (1915), p. 123.

¹¹ See Freud, S., SE, Vol. XXIII, *Moses and Monotheism. Three Essays* (1939 [1934-1938]), p. 132.

but the *group of symmetry* of the mental. The fact that this has not so far been adequately translated mathematically doesn't preclude metapsychology from claiming itself founder of psychology in that it defines its objectivity or, in fact as Petitot writes, what the latter is able to know through what it can't know: in this respect its epistemic proximity to contemporary physics is extraordinary. So this clearly demonstrates how Freudian metapsychology is at the forefront and yet is still a long way from being understood. It's impossible to understand Freud if, as has been the case up to now, he is being interpreted through obsolete conceptual frameworks.

XIV

We come now to the problem of the relationship between different objectivities. As Kant had clearly seen the ontological unity of nature is noumenal while its objectivation leads to gnoseological discontinuity. It's not the ontologies, as Husserl¹² thought, which are regional but the objectivities. This is a delicate point meriting further attention. The founding observation of scientific work focuses on phenomena. These are not regional, nor, as René Thom states¹³ – *saliencies* – but they are still more or less connected to other phenomena which they blend into so that there is no defined boundary between them. These theoretical positions are based on the, incorrect, identification between consciousness and attention. In fact as Freud clearly explains these two functions are, and should be considered, distinct. Attention only concentrates conscious perception at a particular point of the phenomonic field but doesn't, as Husserl thought, constitute a demarcation. *Attention doesn't crop out, it focuses*. The real «cropping out» only occurs through theory via the objectivation process, but also in this case the connection between the objectified phenomenon with its adjacent phenomena is far from being erased, it's just that the experimental self-reflection of theory on the perceptual field reduces the latter to mere background *noise*.

Therefore the leap occurs only between the various scientific objectivities, and naturalization must account for this leap and justify it but must absolutely not ignore it.

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What do I mean when I say that naturalization must account for and justify this leap between scientific objectivities? I mean that the emerging gnoseological layer must benefit from conceptualities which have a conjunction/disjunction role compared to the layer from which it emerges. In psychoanalysis for example this

¹² See Husserl, E. (1952), *Phänomenologische Untersuchungen zur Konstitution*, Book II.

¹³ See Thom, R. (1988), *Esquisse d'une Semiophysique. Physique aristotélicienne et Théorie des Catastrophes*.

role is carried out by the concept of «desexualizability of the libido». Freud writes very clearly in *The Ego and the Id* that without this, psychic life is unthinkable.

We have reckoned as though there existed in the mind – whether in the ego or in the id – a displaceable energy, which, neutral in itself, can be added to a qualitatively differentiated erotic or destructive impulse, and augment its total cathexis. Without assuming the existence of a displaceable energy of this kind we can make no headway. The only question is where it comes from, what it belongs to, and what it signifies.

[...] In this present discussion, moreover, I am only putting forward a hypothesis; I have no proof to offer. It seems a plausible view that this displaceable and neutral energy, which is no doubt active both in the ego and in the id, proceeds from the narcissistic store of libido – that is desexualized Eros.

[...] If this displaceable energy is desexualized libido, it may also be described as *sublimated* energy; for it would still retain the main purpose of Eros – that of uniting and binding – in so far as it helps towards establishing the unity, or tendency to unity, which is particularly characteristic of the ego. If thought-processes in the wider sense are to be included among these displacements, then the activity of thinking is also supplied from the sublimation of erotic motive forces.¹⁴

The libido in Freud is defined as the energy of sexual drives having therefore a biological basis. This basis – writes Freud in *Instincts and their Vicissitudes* – is recognisable exclusively in the aims of the drives¹⁵ in that only through knowing these can we arrive at their organic sources. The sexual goals therefore constitute an element of gnoseological continuity between the biological and the metapsychological. But the sexual goals can also be desexualized, i.e. mutating into other non sexual goals, this makes the return to their sources inaccessible, thereby interrupting the previous gnoseological continuity and making the psychology autonomous from the biologic. Therefore the concept of desexualizability plays a twofold gnoseological role; it recognizes the biological genesis of what is actually psychic but at the same time establishes the autonomy of the latter. It deals with a «zipper-concept». I reiterate that this autonomy of the mental is exclusively gnoseological and not ontological, it is exclusively focussed on creating objectivity. Therein it is clearly visible how crucial the difference is between the Freudian concept of the libido and the Jungian concept. Proposing an *originally* undifferentiated energy as Jung does¹⁶ means proposing an absolute autonomy of the mental from *whichever* substrate, an ontological autonomy in a metaphysical sense. Instead by proposing a desexualizable sexual energy to the origins Freud proposes a relative autonomy, purely gnoseological, of the mental.

¹⁴ Freud, S., SE, Vol. XIX, *The Ego and the Id* (1923), pp. 44-45.

¹⁵ See Freud, S., *Instincts and their Vicissitudes*, p. 123.

¹⁶ See Jung, C. G. (1912), *Wandlungen und Symbole der Libido*.

For this reason the Freudian libido cannot exist without a substrate from which it originates while the Jungian libido can (exist), which explains clearly the «Swedenborgian» developments of his thought.

XVI

Therefore a first point for reflection is offered to those who will collaborate on the project: everything I've presented up to now requires a radical rethinking of both the status and the relationship between the various disciplines involved in the study of the phenomenon of hunger. This necessitates a change in cognitive strategy.

XVII

A second point comes from the fact that is it not possible to imagine a genesis of psychology starting directly from neurophysiology. Every attempt to do so has involved and involves using what one is trying to establish. For example in the neurophysiological studies of thirst – which Derek Denton conducted and reported on in his book *Primordial Emotions* –¹⁷ the researcher can't not ask the subjects of the experiment *when* or if they feel thirsty and *how* thirsty they are, on an arbitrary scale from 1 to 10, because in order to reveal the genesis of the mental it should pass through the psychic. All experiments of this nature are materially affected by this substantial flaw, i.e. how to explain something through what you are attempting to explain.

XVIII

In the above mentioned experiments there is another interesting aspect which is that the functional MRI showed the activation of two distinct cerebral areas, one of which was abruptly deactivated at the moment of water intake, while the other showed no change. This demonstrates how only the first area is able to express the semantics specifically of thirst, while the other has no psychic value and was in fact interpreted as showing sodium concentration in the bloodstream.

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These experiments clearly demonstrate two things:

- it is impossible to construct the mental starting from neuronal dynamics for the simple reason that *in order to identify the semantics it is necessary to go via psychology*;
- not everything which happens in the brain is psychological: what is needed is a selection criterion and that *this criterion even though it manifests itself in physiology cannot be defined by it*.

¹⁷ See Denton, D. (2005), *The Primordial Emotions. The Dawning of Consciousness*.

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Similarly many semiologists and psychologists believe that retracing the structuring of thought would end up flowing into neurophysiology, namely that cognitive syntax could adhere to the neurophysiology of the brain like a stamp sticks to an envelope. This crude illusion collides of course with the fact that the syntactic expression of thought has nothing to say about its neurophysiological dimension. At most it revisits vague pseudo-biological concepts like Greimas's «tymique»¹⁸ or recognizes *oborto collo*, with Patrizia Violi, that «at the very foundation of meaning, at its most profound, and perhaps before any convention or rule, we find an instinctual intentionality composed of emotions and sensations which are rooted in our bodily, perceptual and psychic organization and in the qualities that, perhaps already registered in the form of the natural world, colour our world with values, feelings, attraction and repulsion».¹⁹ In the previous citation I would like to draw attention to the aversion to the appropriate use of the absolutely Freudian concept of drive which the author however seems unable to do without: the vaguely «Husserlized» drive is reduced to a generic reference to the organic which instead in Freud is precisely *Kraft, force*, therefore a physical concept not biological.

XXI

As long as one attempts to move directly from neurophysiology to psychology or vice versa this type of impasse will be inevitable. This is because there should be an intermediary step of physics of mental or what Freud calls metapsychology, which forms a bridge between biology and psychology mediating the relationship between the biochemical properties of the organism and the syntactic deployment of sensations and emotions in thought.

XXII

Metapsychology starts from the idea that the human organism senses neither biochemical compounds nor particles or waves: *the body senses forces and forms*. The material of the forms, called *representations* by Freud, is external to the organism while its formal shape is implemented by the subject itself. Recalling my words from point 14, it is clear that scientific objectivation finds its natural basis in precisely this process of psychic definition of forms. These lie at a mnestic level and incorporate also the qualities, because no forms exist which are devoid of them. The forces, defined by Freud as *stimuli* and *drives*, arrive externally and internally. The organic internality does not correspond to the subjective internality,

¹⁸ See Greimas, A. J., Courtés, J., (1986), *Sémiotique. Dictionnaire Raisonné de la Theorie du Language*. Tome 2. Voice «Thymique», p. 238.

¹⁹ Violi, P. (1997), *Significato ed esperienza*, p. 348. [The English translation is ours.]

what is defined subjectively as internal cannot automatically be transposed onto what is organically internal. The foundations of subjective interiority are the drives.

Metapsychology therefore can be modelled in terms of dynamics which affect the substratum representations. There are two types of these dynamics:

- the dynamics *of* the substratum, because the representations reorganise themselves over time;
- the dynamics *in* the substratum, when various types of stimuli take it over.

XXIII

The concept of the drive as a threshold concept between the somatic and the mental fully satisfies this need for mediation between neurophysiology and cognitive syntax. In order to reveal a sensitive-emotional syntax, biochemistry must first be able to express itself as a sensed force, i.e. as semantics. It is no accident that the Freudian definition of drive is vectorial in that the four terms, source, pressure, aim and object used to define it juxtapose exactly with the defining terms of a vector, i.e. point of application, magnitude, sense and direction.

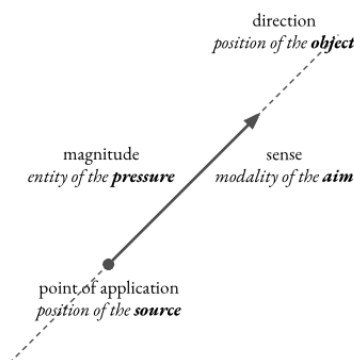


Figure 2

While the following identifiers, i.e. source/point of application point and pressure/magnitude are obvious, aim/sense and object/direction need to be explained. The identifiers aim/sense relies on the fact that as there could be two senses so the aim can be active or passive. The object/direction depends instead on the fact that the objects can be multiple as can the directions, also from the fact that the relationship between the pressure and the object can be correctly described as an orientation. The identification of the drives as vectors isn't only a mere analogy, in fact drives like vectors can be added and multiplied by a scalar.²⁰

²⁰ Freud lists very different phenomena under the category «sources of infant sexuality», but in the final analysis they can be regrouped into two categories: arousal of the erogenous zones through various stimuli, and «indirect sources» like «mechanical

XXIV

Given that in this context the object concept plays a very particular role it requires further clarification starting from the Freudian definition.

The object [*Objekt*] of an instinct is the thing in regard to which or through which the instinct is able to achieve its aim. It is what is most variable about an instinct and is not originally connected with it, but becomes assigned to it only in consequence of being peculiarly fitted to make satisfaction possible. The object is not necessarily something extraneous: it may equally well be a part of the subject's own body. It may be changed any number of times in the course of vicissitudes which the instinct undergoes during its existence; and highly important parts are played by this displacement of instinct. It may happen that the same object serves for the satisfaction of several instincts simultaneously, a phenomenon which Adler [1908] has called a «confluence» of instinct [*Triebverschränkung*]. A particularly close attachment of the instinct to its object is distinguished by the term «fixation». This frequently occurs at very early periods of the development of an instinct and puts an end to its mobility through its intense opposition to detachment.²¹

It must be added that the object has a double nature; it's a mental representation and also a thing that comes from the outside world. The first operates to source the second in the area outside the mind and therefore is itself equipped with a precise location within the psychic space.

XXV

The fact that the drive in its fundamental state has no object implies that it has no privileged direction which is the same as saying that it is in a condition of *rotational symmetry*. So can a condition such as this be considered negligible? I don't believe so because in metapsychology it corresponds exactly with the psychic feeling of anxiety, so important in the human psychic experience. «At birth no object existed and so no object could be missed. Anxiety was the only reaction that occurred».²²

This is the fundamental case that remains the prototype for all subsequent situations of danger.

arousal», «muscular activity», «active processes», «intellectual work». This second category of sources is not at the origins of a specific partial drive, but contributes to increase «the sexual arousal» in general. [Laplanche, J., Pontalis, J.-B. (2022), *Vocabulaire de la psychanalyse*, voice «source de la pulsion», pp. 449-450. [The English translation is ours.]

²¹ Freud, S., *Instincts and their Vicissitudes* (1915), pp. 122-123.

²² Freud, S., SE, Vol. XX, *Inhibitions, symptoms and anxiety* (1926), p. 170.

Birth was seen to be the prototype of all later situations of danger which overtook the individual under the new conditions arising from a changed mode of life and a growing mental development. On the other hand its own significance was reduced to this prototypic relationship to danger. The anxiety felt at birth became the prototype of an affective state which had to undergo the same vicissitudes as the other affects. Either the state of anxiety reproduced itself *automatically* in situations analogous to the original situation and was thus an inexpedient form of reaction instead of an expedient one as it had been in the first situation of danger; or the ego acquired power over this affect, reproduced it on its own initiative, and employed it as a warning of danger and as a means of setting the pleasure-unpleasure mechanism in motion.²³

Freud writes that in all these cases anxiety is generated as «a reaction to the danger of the loss of object itself»,²⁴ which doesn't mean that this danger arises from the simple *possibility of loss* of the object when it is still present, but as is clear from the context,²⁵ from the fact that the object is *actually* lost. The drive vector therefore is in a condition of rotational symmetry. The recovery of the object implies something analogous to *spontaneous symmetry breakdown* as it's known in physics. An event which Freud believes is due to the interaction of the Id with the external world which progressively creates the Ego.

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The concept of force, given that on the one hand it is an expression of a substratum but on the other is something which can be perceived and expressed syntactically (and perhaps formalized), lends itself very well – as Kant saw clearly –²⁶ to epitomizing the role of semantics mediating between biology and psychology.

XXVII

One of the obstacles which impede acknowledging the physics of thinker (metapsychology) as a bridge between neurophysiology and its psychological expression (syntactic) derives from the lack of a clear distinction between sense and meaning. This distinction is however very clearly articulated by Freud. The concept of *object representation* in fact directly corresponds to Saussure's

²³ *Ivi*, pp. 161-162.

²⁴ *Ivi*, p. 170.

²⁵ «Our starting-point will again be the one situation which we believe we can understand – the situation of the infant when it is presented with a stranger instead of its mother. It will exhibit the anxiety which we have attributed to the danger of loss of object». *Ivi*, p. 169.

²⁶ See Kant, E. (2004), *Opus postumum*, pp. 26-39 *e passim*. [The English translation is ours.]

linguistic sign that it's a combination of a *word presentation* with one (or more) *thing presentation*, these last being the homologies of Saussure's signifier and signified.²⁷ In Lacan's purported «return to Freud» he thought this fragment of the Freudian modelling of linguistic phenomena was sufficient for him, without realizing that by so doing not only did he seriously mutilate it but he also distorted its meaning. In Freudian terms discussion of «precedence of signifier over signified» means in fact making the preconscious the qualifying point of the mental, reducing the unconscious, where the representation of thing or signified usually resides, to mere effect, epiphenomenon of the preconscious dynamics. Not only as it also means forgetting that a metapsychological formulation of Saussure's sign was a long way from sufficing for Freud, in that he added *Affektbetrag*, that *affective value* indicator of drive onset, which is none other than the metapsychological name of meaning. Freudian semiotics is defined precisely in this semantic addition to Saussure's linguistic theory, which means that while the signified is a representation, the meaning is the result of the application of a force, a *work* in physics terminology,²⁸ such that its understanding isn't reduced to other than the *perception of a work on the substratum of representatives*. It's precisely this work which connects the signifiers needed to express it in this discursive chain, contemporaneously selecting from all possibilities the relevant signified given that every signifier usually has a plurality of signified. In simple terms for example the expression «a plate of spaghetti Bolognese», even though identical to the signified will have a different meaning depending on one's hunger.

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René Thom noticed this when he coined the term «prégnance»²⁹ for meaning as distinguished from the mere signifier «saillance». However he didn't qualify this further or sufficiently differentiate it from the signified, and senselessly and ridiculously allowed it to emerge from the simple idea of salience. This gives me occasion to condemn another of the major hindrances which impede metapsychology from claiming its rightful place in the overall general theory of the mind. I speak of the very frequent confusion around semantics and its syntactic expression. Semantics does not reside in syntax, is not generated by it and does

²⁷ Freud, S., *The Unconscious* (1915), p. 201. If we consider that Freud expressed this in 1915, therefore almost contemporaneously with Saussure's Geneva courses (1906-1911) which were only published in 1916, it merits fully acknowledging Freud's thoughts on linguistic phenomena.

²⁸ In physics work is the energy transferred by a force between two systems when there is a displacement. The question is *towards what* is the drive force applied: certainly not towards the representations which are specifications of the dynamic substratum, but towards the connections between them.

²⁹ See n. 13.