Chapter 18. From revolution to depression

Where does the message hide?

J. Benveniste was well aware that one of the main stumbling blocks of his research was the fact that the electromagnetic “biological activities” and the effect on the biological system defined themselves mutually in a circular reasoning. A way for breaking this circle was for example to show that the structure of water was actually specifically modified after exposure to the electromagnetic waves. Another possibility allowed by the recording/digitization method was to find proof on what differentiated an “active” recording from an “inactive” one using well-established methods of signal analysis.

Using various computing tools of signal analysis, D. Guillonnet tried to show a difference in the frequency spectra of the recordings. But classic methods such as the Fourier analysis did not succeed in discriminating the various recordings which appeared to be nothing else than “noise”. However, one could not rule out the possibility that the “digitized biological activity” was present only in some frequencies. Moreover, spectrum analysis is a complex specialty and other methods requiring sharp mathematical knowledge exist. It was thus decided to call on specialists of signal analysis, Professors Jacques Neyrinck and Mura Kunt, from the *Ecole Polytechnique Fédérale* of Lausanne (EPFL).

But, before starting these complex analyses, the EPFL team wished, with good reason, to convince itself about the reality of the claimed biological effects. Marcel Odier, the Swiss banker whom we have already presented, was an intermediary in Geneva for the establishment of a rigorous protocol which was acceptable for both teams. A common agreement on the protocol was obtained at the end of August and the recordings were performed in Lausanne on September 25th, 1997.

The Swiss experiment

On the appointed day, in the premises of the EPFL, J. Benveniste performed at first two open-label recordings labeled “Water-initial” and “Ionophore-initial”. Then, in the presence of the only members of the EPFL, three “water” recordings numbered from “Water 1” to “Water 3” and three “ionophore” recordings numbered from “Iono 1” to “Iono 3” were performed. These 6 recordings were then distributed in a random manner according to a software in

10 blind recordings numbered from "Test 1" to "Test 10" (Figure 18.1). Some of the 6 initial recordings could be thus present in several copies. Then, to make sure that the experimental conditions did not vary with time, J. Benveniste once again performed two open-label recordings labeled "Water-final" and "Ionophore-final".

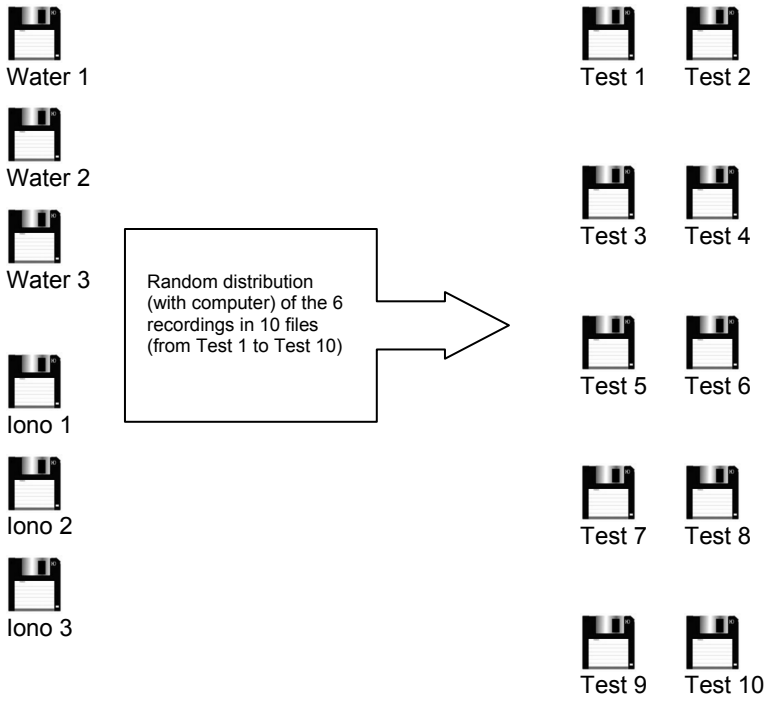

Figure 18.1. Design of the experiment at Lausanne of September 25th, 1997. The purpose of the experiment was "to guess" the order of the "active" and "inactive" recordings. Six recordings were performed (3 "active" named from Iono 1 to Iono 3 and 3 "inactive" named from Water 1 to Water 3). Then these recordings were distributed at random in 10 files. The only constraint was that each recording was present at least once among the 10 recordings to be tested (from Test 1 to Test 10). The number of possible "active" recordings varied thus from 3 to 7.
Two open-label recordings (one "inactive" and one "active") were also performed at the beginning and at the end of the experiment.

J. Benveniste came thus back from Lausanne with 10 blind floppy disks labeled from "Test 1" to "Test 10" and 4 open-label floppy disks (2 "water" recordings and 2 "ionophore" recordings). The recordings were tested during 12 sessions on 12 hearts from September 30th to October 15th. One of the two

systems of Langendorff having been unsettled since the recordings were now directly "transmitted" to the system, the recordings were not tested anymore on two devices of Langendorff in parallel. Nevertheless, numerous in-house blindings were performed and even the open-label recordings were tested blind for the experimenter. The results in increasing order of biological efffects are presented in Table 18.1. We notice that 6 recordings induced a biological response (Tests 1, 3, 5, 6, 9, 10) whereas 4 others were inactive (Tests 2, 4, 7 and 8).

Tested recordings	Number of measurements	Maximal changes of coronary flow (%)	Increasing order of biological activities
Blind experiments			
Test 4	4	4.3 ± 0.2	1
Test 2	7	4.7 ± 1.6	2
Test 7	5	5.0 ± 2.4	3
Test 8	4	5.1 ± 4.0	4
Test 1	11	16.2 ± 9.1	5
Test 3	5	17.1 ± 10.8	6
Test 10	6	20.3 ± 15.8	7
Test 5	4	21.3 ± 11.3	8
Test 6	4	22.9 ± 10.3	9
Test 9	6	26.9 ± 16.2	10
Open-label experiments (in-house blinding)			
Digital Water "initial"	5	3.1 ± 0.3	-
Digital Water "end"	6	2.3 ± 1.2	-
Digital Iono "initial"	5	24.0 ± 4.5	-
Digital Iono "end"	7	25.2 ± 15.0	-
Iono 10^{-6} mol/L	8	36.7 ± 18.5	-

Table 18.1. Experiment of September 25th, 1997 (before unblinding) performed in Lausanne during the collaboration with the EPFL. We notice that 6 recordings increased the coronary flow with large changes (Tests 1, 3, 10, 5, 6, 9). Moreover, the open-label controls, which were performed to verify that the recordings were done in good conditions, were correct: some of them were done at the beginning of the session ("initial") before the blind recordings and others at the end of the session ("final"). This allowed making sure that the experimental conditions did not vary during the recording session. Note that these recordings were performed in open-label conditions but were tested after in-house blinding. [1]

An uncertain "genealogy"

At the end of the experiments – but before the unblinding – J. Benveniste, undoubtedly very careful for this experiment, wrote on October 15th a text

intended for the team of the EPFL in which he insisted on some possible issues:

> "Before interpreting the results, it is important to underline some points. We did not exactly reproduce the experiment of Chicago because in this last case files were separately transmitted to us every day, and especially we had made numerous preliminary trials (two months of on-the-spot development) to make sure that everything worked correctly in the setting of Chicago. On the spot, in Lausanne, we had to use our laptop computer in conditions which were different than in our laboratory, what obliged us, among other things, to keep a monitor switched on nearby. Furthermore, there is good reason to believe that the preamplifier of the input microphone of the laptop is clearly of less good quality than the Luxman preamplifier that we usually use."

J. Benveniste seemed to prepare the ground. He has already undergone so many setbacks during public experiments that he apparently has difficulty in believing that the trend could be abruptly reversed. But the technical arguments which he put forward to explain future possible "anomalies", even if they were acceptable, should also apply to the open-label recordings. Yet, one can notice that these open-label negative and positive controls were "as expected". J. Benveniste continued by evoking the various profiles of possible results:

> "Having clarified this issue, these experiments can give four types of results:
>
> 1. No influence on the heart indicating that we are not capable of recording a biological activity as we claim.
> 2. All the activities transmitted to the heart induce reactions on the coronary flow, which indicates that the effects are not specific and depend only on the presence of an electromagnetic field.
> 3. Some recordings induce cardiac reactions and others do not. However, after unblinding, we notice that the water recording (a control that should be negative in principle) induces reactions in a number *x* of cases, while ionophore recording induces no effect in a number *y* of cases. In this case, it is once again a purely technical problem of "crossing" that we show from time to time and that, for the moment, we do not understand and in fact have no control over it.

4. After decoding, it appears that we correctly identified the active and inactive recordings in a statistically significant proportion."

One understands that points 1 and 2 are envisaged only on a purely formal plan. The point 4 is a kind of Grail whose the quest remained fruitless until now. Thus, J. Benveniste was afraid to come again across the scenario of the point 3 with this problem of "crossing" which, as he soberly recognized, occurred "from time to time". We also note that for him this problem remained "purely technical". The foundations of "digital biology" are not be questioned. In any case, what alternative hypothesis could explain that some of the recordings had a biological effect in a repeated and coherent way? The results – unblinded – which he had in front of him allowed him to continue his analysis:

> "We already know that we are placed neither in the first case nor in the second one. We observed the usual series of activity between 20 and 40% and series of inactivity around 5%. However, in the preliminary experiments and in a once again inexplicable manner, open-label recordings corresponding to water gave typical activities while on the same day recordings corresponding to ionophore were inactive. On the next day, the activities were observed at their normal place. It is thus a problem of technical manipulation which makes some activities "inverted", but at present we do not understand why."

He finally specified how future efforts should improve the system:

> "In any case this experiment once again proves that our biological system reacts in a systematic way to some signals and never to others while the signals are quite similar and are replayed with identical power. We thus have to admit that the hearts of guinea pig reveal a message on the nature of the signal. It seems to us that the step replay/reproduction of a signal works correctly while the recording and the correspondence initial molecule/recorded signal must be again considerably improved."

And, he concluded, as if he anticipated the result of the experiment:

> "If after unblinding of the current experiment, we also found errors, we could exactly reproduce the experiment of Chicago by sending the activities one by one and probably by recording them on arrival on separate floppy disks (However Didier Guillonnet as an IT specialist cannot admit, on a strictly technical plan, that there could be the slightest difference between the recording on a hard disk and on a floppy disk). It seems more judicious to us to

improve the recording because the anomaly – if there is an anomaly – is not apparent at the time of "replay".

The code is sent to Clamart on October 16th by fax and what J. Benveniste anticipated occurs. Without being cruel, one must admit that the failure exceeded all expectations…

Tested recordings	Maximal changes of coronary flow (%)	Increasing order of biological activities	Unblinding
Test 4	4.3 ± 0.2	1	Digital water
Test 2	4.7 ± 1.6	2	Digital water
Test 7	5.0 ± 2.4	3	**Digital Iono.**
Test 8	5.1 ± 4.0	4	**Digital Iono.**
Test 1	16.2 ± 9.1	5	**Digital Iono.**
Test 3	17.1 ± 10.8	6	**Digital Iono.**
Test 10	20.3 ± 15.8	7	**Digital Iono.**
Test 5	21.3 ± 11.3	8	Digital water
Test 6	22.9 ± 10.3	9	Digital water
Test 9	26.9 ± 16.2	10	**Digital Iono.**

Table 18.2. Unblinding of the results of the experiment of September 25th, 1997 done in collaboration with the EPFL. In spite of the internal coherence of the results, the distribution of the "active" and "inactive" tubes is not better than random. Indeed, the recordings supposed to be more "active" (bold characters), that is digital ionophore, are not grouped at the bottom of the right column (in the frame) but are distributed in a random way.

It was indeed a complete chaos (Table 18.2). Moreover the simple idea to duplicate some of the recordings was devilish and gave completely destabilizing results. Indeed, except the fact that the number of active recordings – not known by the experimenters – was not found (5 and not 6), it was especially the results with the duplicated recordings that were particularly destructive for the credibility of the experiment in front of the Swiss specialists. Because, as for the experiments with G. Charpak, they can judge only the part of the experiment that they controlled, namely recording and blinding of the various samples. Let us see the "genealogy" of each of the recordings and the corresponding results that is displayed in Figure 18.2. The recordings "Water 1", "Water 3", "Iono 1" gave positive or negative tests after simple duplication! Nevertheless each of these recordings gave coherent results in numerous measurements (with blinding within the team of Clamart). It became difficult for J. Benveniste to assert that the problem would be situated rather at the time of the recording.

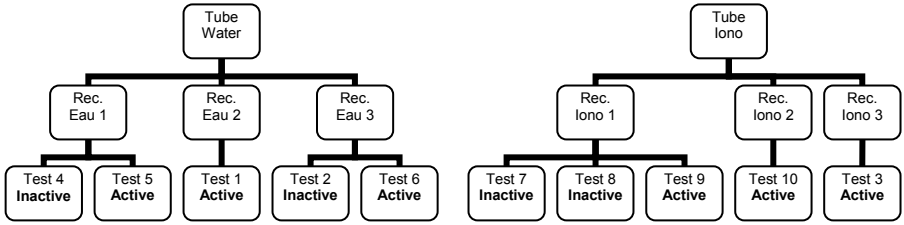

Figure 18.2. Three recordings (Rec.) of water supposed to be inactive numbered from "Water 1" to "Water 3" and three recordings "ionophore" supposed to be active numbered from "Iono 1" to "Iono 3" were performed. These 6 recordings were then distributed in a random way according to a software into 10 recordings numbered in a blind way from "Test 1" to "Test 10". There were thus several copies of some of the 6 initial recordings. The origin of the recordings seemed to have no influence on the associated biological effect ("active" or "inactive").
The open-label recordings "Water" and "Iono" performed at the beginning and at the end of the experiment (not shown here) were associated with "expected" results.

Consequently, despite the successive improvements which were supposed to discard the stumbling blocks, J. Benveniste and his team were back again in the same configuration. It seemed that there was no progress and that the successive technical improvements had no incidence on the results of the experiments. It was as if the team of Clamart found in experimental results only information which was already available. Yet, once again, in-house blinding was done. Needless to say that the collaboration with the specialists of signal analysis could not continue in these conditions. The EPFL team suggested to postpone the collaboration until the "technical problems" would be fixed.

Notes of end of chapter

[1] There are some minor differences in the reanalysis of the results for the calculation of the mean percentages of cornonary flow changes compared with the results calculated by the team of J. Benveniste and transmitted to the EPFL.